University of Alberta

Characteristics of Effective Bedside Teaching

by

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Dedication

بِسْمِ ٱللَّهِ ٱلرَّحْمَٰنِ ٱلرَّحِيمِ

To my beloved parents

Abstract

Bedside teaching is a method of learning clinical medicine that involves an experienced teacher instructing students in the presence of a patient, whose condition triggers the learning. This can occur as part of the clinical care of the patient, as occurs in North America, or be intended exclusively for education. The parameters determining the effectiveness of bedside teaching have never been clearly defined, nor is it known whether the factors that lead to success are common to all bedside teaching or are context-dependent.

This study was thus designed to identify the factors involved in effective bedside teaching by determining the views of both clinical teachers and final-year medical students at the University of Alberta, Canada and Sultan Qaboos University, Oman. The main research questions were:

1- What are the characteristics of effective bedside teachers?
2- What are the characteristics of an effective bedside teaching process?
3- What are the characteristics of an effective bedside teaching setting?

A purpose-made questionnaire was developed, where possible on the basis of existing literature, piloted, and administered. Results from 309 respondents were analyzed using standard statistical approaches such as exploratory factor analysis. Major conclusions were:

1- Effective bedside teachers show behaviors that can be developed. Such behaviors include general properties such as being a good communicator, and more specific properties such as teaching practical rather than theoretical issues. Characteristics that cannot readily be changed, such as gender or rank, were seen as much less important.

2- An effective bedside teaching process could involve six domains, Preparation, Introduction, Experience, Summary, Explanation, and Conclusion, in agreement with some theoretical models. This is mostly independent of context.

3- An effective bedside teaching setting depends significantly on context, but smaller student groups, and sessions of 36-60 minutes are preferred.

This suggests that there are specific characteristics of bedside teaching that transcend culture and are shared by students and teachers. Those findings may enable us to develop better means for evaluating bedside teaching and better methods for faculty development. Future directions should include further development of the instrument, and investigation of the perceptions of other stakeholders.

Preface

I would respectfully ask my examiners to read this preface before reviewing the thesis. It is intended to provide some background for the work that is reported and describe the mindset of the researcher. Moreover, it is intended to explain the structure of the thesis. Such, information does not belong to the genre of information usually located in the introduction, which is conventionally used to review the background information.

I will start with some memories from my undergraduate medical school experience, simply because some of them have shaped my future.

The first instance was at the beginning of my clinical training. "This yellow book is your bible; never dare to attend my teaching before memorizing it all" This was the take-home message I received at the first teaching session. The teacher, of course, was not happy with our theoretical information. When he uttered the aforementioned statement, he was referring to a huge 'pocket' textbook of medicine from Oxford.

The Head of Surgery asked me on the first day of my surgical clerkship: "Tell me in detail how would you operate on this patient to carry out an acute appendectomy?". I thought he was joking, but he was NOT. The question was serious and he went to on to say: "you should do one by the end of your 8-week clerkship here!"

Dr. Ali, was a cardiologist who started his first session around a patient's bed by greeting the patient and he then introduced us to him as the "generation of doctors who will take care of you in few years' time." He introduced the patient by his full name with a smile. "You know that the heart has four chambers". This was his first statement from which he departed into teaching, in a wonderful way, how to deal with a patient with heart problems. That night I couldn't sleep for two reasons. The first was the great responsibility I carried on my shoulders, as gently pointed out by Dr. Ali. In a few years time I would be in his position taking care of my people so I had to be ready. The second was being touched by the wonderful way he practiced his skills; that stimulated me to repeat that encounter in my mind second by second trying to visualize how I could be the same as Dr. Ali. I thought, "That is the medicine that I want to practice!"

Clearly, with a lengthy list of similar memories, I felt that something had to be done in changing the way medical students are taught clinical medicine. The first time I broke the news about my interest in pursuing a medical education career to my director at work, he asked me to forget it because I made an excellent doctor and "they can find anyone to do the medical education job!" It took me two years of meetings, convincing and doing courses at my own expense until my hospital was convinced that I should pursue medical education. It was tough, but life is never easy!

The context in which all of this was taking place was the Sultan Qaboos University (SQU), which was founded in 1986. It is located in Muscat, the Capital City of the

Sultanate of Oman. It includes eight colleges. The University is government-run and funded with a visionary goal of providing Oman with qualified graduates in all fields to further develop the country, cater for its people and replace the expatriate workforce that helped building the modern infrastructure in the country from scratch over the last three decades. The foundation of the College of Medicine and Health Sciences at SQU was facilitated by a group of international experts, mainly from the University of Western Ontario, where its first Dean also came from. The college includes a School of Nursing, which will soon be a separate college, and a School of Laboratory Medical Science, with plans to add Dentistry and Pharmacy schools soon. It has graduated around 700 doctors to date. The undergraduate medical program lasts seven years and students enter medical school immediately after they have finished high school. There is a strong competition for admission to medical school. The first four years of the program comprise basic and clinical science courses after which there is a three-year clerkship. Students complete a one-year rotating internship after they have graduated, and may proceed to postgraduate training either in Oman or abroad. There are about 120 students in each year of the program, and the rules of the College of Medicine and Health Sciences specify that there must be equal numbers of males and females admitted.

During the clerkship, there are lectures, seminars, conferences, rounds and a particular form of bedside teaching in which students learn from a preceptor in the presence of a patient, whose medical needs are taken care of at another time. The students also have exposure to patients during their medical care, but most of the bedside teaching is done at these assigned times, which I have called “Protected Time Bedside Teaching”. This system is very different from the system in Canada, in which teaching the students and caring for the patient occur at the same time.

It thus seemed interesting to look at bedside teaching in both Oman and Canada. The background information, available work on bedside teaching and the details of the work that was carried out will be found in the Introductory Chapter and the following papers which have been accepted for publication are being revised or are awaiting an editorial decision. The thesis concludes with a general overview of the findings with a clear statement on further directions for research. There are a number of appendices which include further details of the instrument used and the results obtained.

It should be made clear that this study was originally designed to ask a rather simple question: What are the perceptions of students and instructors about an ideal bedside teaching experience? It was not designed to test a model, although available models of bedside teaching provided some information about what questions to ask. The results were consistent with several models that had been proposed previously based mostly on the experience of the authors, rather than on objective evidence. Because opinions were obtained from students and instructors, in both Oman and Canada and in three domains: instructor characteristics, process characteristics and setting, a variety of comparisons soon became possible. We have started to explore these comparisons, even though this was not the original intent. We chose those comparisons that seemed to be most interesting, but there are other ways of looking at the data that we have yet to explore.

We made a decision early in the course of my studies to publicize our work in different forms and forums to get as much feedback as possible, which was necessary because I was a doctor with no background in education. That is why I have chosen the paper-format and presentation-nature of this thesis. Four articles have already been written and several conference presentations have been made, one of which won a prize at the national level in Canada. It was perhaps an indication that we are doing something sensible and of interest a wider community of medical education. There are five more possible articles in the pipeline.

During the work carried out in pursuit of this research, I became interested in a variety of issues related to education in general and medical education in particular. Though they are relevant to the thesis, they would not normally be acceptable inclusions for a published article, either because they would make the paper too long, or because they involved discussions that were too speculative or separated from the main topic of the paper. However, I believe they have a significant contribution to future research. These ideas have been included in the general discussion that follows the publications.

It is worth noting here that English is not my mother-tongue. My supervisor, Dr. Cook, has provided some editorial correction to the papers and the Introduction, Methodology and Conclusion Chapters. The thesis and the ideas presented do represent my work carried out under supervision. The words are my own, save for some grammatical adjustments or paraphrasing.

Few days back, I asked a friend who is a neurosurgeon, to have a look at one of my papers. He came back saying "this is all logical, so why do you have to research it?" I said: "Of course, it may look simple and rational, but unless you research it and put it on paper for people to read and scrutinize, it will remain an anecdote… and no matter how many anecdotes we can have, they do not stand as evidence." On the other hand, my neurosurgeon-friend was right. The prevailing culture of medical practice is used to hearing only 'whispers' from the medical education professionals. Moreover, such whispers tend to be mostly about assessment and certification!

Attempting to bridge the gap between education and medicine puts more difficulty on my shoulders as a trained and practicing doctor trying to investigate a quintessentially educational problem. Though the path is not easy, it is worthy, doable and fascinating.

I hope this fascination will continue to stimulate me and make you enjoy reading my thesis.

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Key Words

Bedside teaching

Survey

Teacher characteristics

Process characteristics

Setting

Chapter I

Introduction

A comprehensive history of medical education remains to be written, but the origins must lie in the development of the discipline of medicine itself. From the earliest beginnings of human attempts to treat disease, the use of plants and even surgery was accompanied by an apprenticeship system in which novices learned the therapies from a master. Much of the early work involved not only medicine but religion (Marketos and Papaeconomou, 1992) and medicine and learning the practice of medicine was rooted in the temples of Egypt and Greece and the Monasteries of Europe (Zucconi, 2007). A formal practice of medicine is thought to have begun with the ancient Greeks, whose method of rational inquiry formed the beginnings of the use of observation and reasoning in considering disease. The process of rational interpretation and discussion represent the foundations for teaching medicine, and were practiced in schools such as that at Cos, where the Greek physician Hippocrates is said to have taught in the 5th century BC and where he originated the oath that became a credo for medical practitioners through the ages (Marketos, 1997). The further rise of rational practice which started in the second millennium with the work of Galen (129-~207AD) (Eknoyan, 1989) was helped a great deal by the great Arab physician Ibn Sina (Avicenna) (980-1037) whose texts on medicine were used for several hundred years and provided the basis for the famous medieval medical schools in Louvain and Montpelier (Sirasi, 1987). While the apprenticeship model remained a critical part of medical education, the use of large lecture theatres enabled many students to learn from a single master physician, and the view of medical education that defines learning as a mixture of hands-on guided practice and lecture was the basis of physician training for many years and is still popular. The increasing complexity of medical knowledge and the development of current concepts of physiology, such as those developed for the circulatory system by William Harvey (1578-1657) led inevitably to an increasing need for science as the basis of medical practice, and the astrological and alchemical components of medicine that had been supported by such figures as Paracelsus (1493-1541) were neglected in favor of a more reasoned approach (Katz, 1977).

There were many different strategies for helping novices to become physicians, but an apprenticeship remained a major approach particularly in the surgical specialties where "barber-surgeons" who were entirely trained on the basis of practical skills were still in existence in the early 1800s (Prioreschi, 2003) . There was generally no attempt to regulate medical education, and anyone could set up their medical school and graduate people who could practice on the basis of what they learned, however outdated or inaccurate. This situation continued in North America until the beginning of the last century, and some parts of the world is still true today, however since the major centres of learning contained a medical school along with other colleges, the better schools started to develop a curriculum that had a least some features in common. In Britain, the medical schools of the early years of the 20th century traditionally accepted students directly from high school and subjected them to a rigorous scientific training which was then followed by a conventional apprenticeship. Because the British at that time had colonized large parts of the world, this model of medical education was exported and the majority of countries that had been at one time part of the British Empire, such as the schools in Africa or Australia, or had been heavily influenced by the British, such as the medical schools in the Arabian Gulf, adopted a similar system. That situation continues to the present time, but there is an increasing tendency to consider alternatives such as the North American model of medical training.

Around 1900, the situation for medical education in North America was confusing and not very effective. There were many schools, but the training was highly variable. Graduates from such Universities as Johns Hopkins received excellent training, but there were a large number of private medical schools, which were turning out physicians whose knowledge of medicine was clearly inadequate. The situation finally came to attention of the Carnegie Foundation, who hired a young educator, Abraham Flexner (1866-1959), to review the medical schools in the US and Canada. His report, which was published in 1910 was highly critical of medical education, and indeed was so critical that a number of medical schools were forced to close (Beck, 2004). No Canadian medical schools were deemed inadequate by Flexner – at that time Medical Schools existed at McGill University (the oldest, in Montreal), Queen's (Kingston), Toronto, Manitoba, Montreal, Laval (Quebec City) and Dalhousie (Halifax). Interestingly, one of the outstanding physicians of the late nineteenth century who laid the important basics of clinical education, was a Canadian who practiced at McGill University but later moved to Johns Hopkins University in Baltimore and then to Oxford. This was William Osler (1849-1919), whose textbook "The Principles and Practice of Medicine" (1892) remained the authoritative medical textbook for over 30 years (Bliss, 1999) .

As a result of Flexner's report, there was a strong emphasis on scientific training particularly during the early part of the program. While Flexner was not enthusiastic about lectures as a means of teaching, he made the point about basic science so strongly that in North America the Universities almost uniformly, adopted a strategy where there was a highly concentrated and often lecture-based approach to teaching in the first few years of the program dealing with the scientific disciplines of anatomy, physiology, biochemistry and so on, and followed by a clinical clerkship (Miller and Weiss, 2008). Over the next fifty years, the fashion of admitting student directly from high school also changed, and now almost every University in North America requires a university degree before the student is admitted to medical school, although for some students the rule may be relaxed. The program is normally four years, the first two of which are "pre-clinical" and the last two are a series of clerkships.

The educational process by which students were taught the basic sciences in increasing isolation from clinical practice persisted until 1966 when McMaster University Medical School, a new institution, decided to adopt a problem-based learning curriculum in which the basic science was taught in the context of "paper" cases. This process attracted almost no attention, other than some derision, based on the mediocre examination performance of graduates from that medical school and the apparent heavy demands of faculty time that this form of teaching required. A "problem-based" curriculum would probably have remained an oddity had not Harvard University under the leadership of Dean Daniel Tosteson elected to attempt this approach in the late 1970s, based on the case study method which had been pioneered by the Harvard Business School earlier (for additional details, see Christensen and Hansen, 1987). The approach suddenly became fashionable and Universities such as New Mexico and Southern Illinois adopted the approach with some enthusiasm (Johnson and Finucane, 2000). By the 1990s, the majority of North American medical schools and a significant number of schools elsewhere (such as Maastricht in Holland and Newcastle in Australia) had a wholly or partly-problem based curriculum. The University of Maastricht was unique in adopting problem based learning across all the different faculties including faculties such as business. Nowadays, most of the 2000 medical schools around the world adopt either a traditional Flexnerian curriculum, a problem based curriculum or a hybrid curriculum. Following the popularity of problem-based learning and the foundation of medical education units in some medical schools to handle the increasing demands of managing educational issues, many innovative ideas surfaced by drawing ideas from experts in education and encouraging discussion between them and those involved in training doctors. For example, the "clinical presentations" curriculum which was developed at the University of Calgary and various other approaches such as "outcome-based education", "context-based education", "competency-based education" and so on have arisen by this mechanism. This matter is mentioned again later in this introduction.

There are two interesting things about the explosive development of medical education in North America – first, almost none of the changes are evidence-based, and second, almost the whole effort has been placed on the first two years (pre-clinical) phase of medical training. Even at McMaster, which was either hailed as a leader or mocked for the same reason, the revolutionary PBL curriculum was followed by a very traditional if somewhat abbreviated clinical clerkship. It is only in the last few years that such things as an integrated clinical clerkship have altered the way in which clinical training is conducted.

Worldwide, the pattern of training is similar; there is period of basic science/clinical science training using a variety of pedagogical approaches followed by clerkships in which students are exposed to the realities of medical practice on the wards or in the clinic, and usually in small groups. There is quite a lot of evidence about the effectiveness of different pre-clinical curricula, although convincing evidence that one approach is better than another is very unusual There is much less information about clinical clerkships. This thesis deals with an investigation into a specific component of clinical training, bedside teaching.

Before going on to discuss clinical training, it is worth mentioning again that until relatively recently medical education proceeded on a completely independent track from general education, and largely ignored the findings from general education, despite their undoubted relevance to medical training. In 1965, George Millar (1918-1998) managed to assemble a group of people with an interest in medical education (McGuire, 1999). He was a physician, but had colleagues whose background was in education rather than in medicine, and this made a substantial difference to the approaches that can be used to educate medical students. Much of the current emphasis on research in medical education comes from joint activities between those who practice medicine and educationalists, and sometimes even from using models from other professions such as business. The medical education literature is growing in volume but sometimes remains limited in focus because of a tendency to discuss only what is fashionable and only what transfers directly to the practice of teaching students. It is encouraging that we have great medical educationalists who are lifting the quality of research in medical education arena in an attempt to fuse what we know about learning in a broad sense with how we prepare people for medical practice. Some of the findings that are relevant to the research I have conducted and that come from general education or postgraduate education in other disciplines, are outlined in chapter II of this thesis.

Clinical Education:

Learning clinical medicine is an essential part of the educational program of any medical school around the globe. It is a cornerstone in the development of future doctors. In most medical schools students spend more than half their time rotating through clinical clerkships. The typical 2-3 years of clinical education consist of a series of horizontal clinical specialty clerkships, during which students learn by different methods the craft of a competent doctor. Clinical education is thus defined as the teaching and learning experiences focused on, and usually directly involving, patients and their problems (Spencer, 2003). These teaching-learning experiences can be divided into two main categories, those that happen without a patient being present, such as morning meetings, seminar discussions, radiology conferences, and so on, and those in which a patient is present, such as ward rounds, outpatient encounters, community service, on-calls, and operating theatre teaching (Hartley *et al*, 2003).

Because of the obvious importance of learning that occurs during the clinical training of students, the quality of the educational experience has been examined, and often found to be deficient. The most significant problems that have often been documented in the literature (Irby, 1995; Metcalfe and Matharu, 1995; Spencer, 2003) are:

- ***Lack of clear objectives and expectations***. In the clinical context, teaching is often unplanned and opportunistic. The circumstances of teaching in the presence of a patient are strongly dependent on the nature of the presenting problem, and the assumption is usually made, on the basis of little real evidence, that if the student sees a large enough number of patients, then inevitably the will see illustrations of everything that they need to know. At one time this may gave been generally true, and may still be true in countries such as Oman, a country which is involved in this study. In Oman, hospital stays are usually protracted and the students have a reasonable chance of seeing most common conditions and gaining an adequate impression of the natural history of the disease from unstructured clinical teaching. Even here, however, there are some problems in that teaching is mostly in a tertiary care hospital and conditions that are common but do not result in hospital admission, may receive less emphasis than is necessary. In North America, the situation is even less successful. The greatly abbreviated hospital stays means that it is more difficult to ensure that the students encounter the patients that will provide the learning opportunities that the students need unless there is an effective coordination with cases that the students encounter in other venues such as outpatient settings (McLeod and Snell, 1991) . In general, those teaching in the clinical years admit to the problem but are not keen to write down what their students should see during a rotation, let alone to frame the outcome in terms of educationally sound learning objectives.

- ***Focus on factual recall rather than on development of problem solving skills and attitudes.*** Medicine has changed because the availability of information has changed. Systems exist in most tertiary care hospitals and increasingly in the offices of family practitioners even in remote areas that can access current information about a particular condition in just a few seconds. Therefore, medical education is preparing students for a different environment than that of the 1960s and 1970s. At that time the students did need to know a lot of fact. Nowadays, the students still need to know a lot of facts, but require more structured knowledge, so that they have the understanding to ask the right questions. The ability to retain large quantities of fact is actually less important, but a large number of clinical teachers graduated at a time where it was still necessary, and teach their students as if memorization was still the key to successful practice.
- ***Teaching pitched at the wrong level (usually too high)*** Most of the instructors in a University Medical School are sub-specialists teaching students in their own area of expertise. It only relatively recently that family physicians, general internists and general surgeons have started to take their rightful place as judges of what students need to know. Even now there is pressure to teach the undergraduate students at the level of a senior resident, and the students often fail to grasp the fundamental basic principles of the topic in consequence.
- ***Passive observation rather than active participation of learners***. The "learning pyramid" (Miller, 1990) makes it very clear that retention of information and its

application is enhanced by participation and inhibited by lack of participation, but in the clinic the student may be deemed too junior or too incompetent to do more than watch and listen. Undergraduate medical students in operating rooms spend hours holding a retractor but not participating in any meaningful way in the surgery, and it is not surprising that even important material gets easily forgotten.

- ***Inadequate supervision and provision of constructive feedback.*** This will be discussed in more detail in the subsequent papers, but a disturbing number of students have NEVER been observed doing a history or physical by the attending physician during an entire rotation. Characteristically, the instructor reviews the findings from the student who did the investigation, but never actually watches what happens, and this leads to two problems. First the student may learn to fake results that they know they should have obtained/observed but failed to do so. Second there is no possibility of coaching the student to take a more focused examination or to avoid potential problems in their interaction with the patient.
- ***Little opportunity for reflection and discussion***. Often another patient is waiting for medical care, or the instructor is so concerned with "covering the material" that they simply move on to provide more information without giving the student a chance to digest what they have just learned. Deep learning occurs when the learner has a chance to consider what they have learned, modify its structure and place it in a context. In the absence of this opportunity for reflection, the information may be lost, partially remembered or contain significant errors or gaps on retrieval.
- ***"Teaching by humiliation"*** The belittling, harassment (sexual and otherwise) and humiliation of students is an approach that is by no means universal, but the majority

of medical students experience at least one aspect of it at some time during their clinical training (Lempp and Seale, 2004) . It is well established that the approach impairs rather than helps learning, but because the instructors may have experienced teaching in this manner during their own training, the behavior persists (Harth *et al*, 1992). In many instances, there is reason to believe that the instructor is unaware that they are actually abusing the student, and see their behaviour as normal and even helpful, which makes it even more difficult to address.

- ***Informed consent not sought from patients, and lack of respect for privacy and dignity of patients.*** There is an inevitable tendency amongst those in clinical practice to see the patient simply as the host of a disease or condition, and this becomes even easier when the instructor is using the patient as a teaching aid. Such things as assuming that the patient will agree to serve as a model for the students, threatening sanctions if they are reluctant to participate, or talking to the students about the patient as if the patient were not present are fortunately relatively uncommon problems, but since the attending physician is a powerful role-model for the students, any behavior of this sort is not only wrong, but also damages student learning.
- ***Lack of congruence or continuity with the rest of the curriculum.*** Clinical training is or should be an intrinsic part of the whole sequence by which an entering student emerges as a doctor. All too often, the basic scientist teaches material which is irrelevant to real practice, and the clinician ignores the underlying science and teaches medicine from an empirical perspective. The unfortunate student may have to unlearn things that they were taught during their pre-clinical training, or be faced with trying to understand a clinical condition which is presented to them in an essentially

"surface" manner. For example, if a student sees a patient with stable angina on the wards, it is much more likely that an attending physician will instruct the students about indications for surgery, prognosis and the dose and adverse effects of the drugs used, rather than asking the students to think in terms of cardiac hemodynamics and the anatomy and pathophysiology of impaired coronary circulation. This observation is based more only my own experiences as a medical student than on objective data, but I am confident that the assertion is substantially correct.

A Clinical Clerkship:

Typically the student rotates through different departments for a specific period of time in multiple sites in what is called a "clerkship". For example, at the University of Alberta, the clerkships in the third and fourth years of the program are shown in Table 1-1. Students usually work with a specific team in a clerkship and they may receive one-on-one instruction or work in pairs or in small groups. The typical clerkship involves joining the clinical activities of the team to which the student is attached. Those activities may involve rounds with the inpatients, attending outpatient clinics, attending different meeting such as imaging and morning meetings, attending seminars or lectures, observing procedures, and doing on-call duties (Daelmans *et al* , 2004). Those activities are part of the typical work of a practicing doctor, and the students can observe and participate in them so that they learn the craft of medicine. Those activities are highly variable between sites even for the same clerkship (Seabrook *et al*, 2000; Gruppen et al, 1993), although we tend to assume that by the end of the clerkship the necessary learning will have occurred.

Table 1-1: Components of a two-year clinical clerkship at the University of Alberta

Year 3		
	Link block (preparation for clinical work)	2 Weeks
	Anesthesia	1 Week
	Family Medicine (rural)	4 Weeks
	Internal Medicine	11 Weeks
	Clinical electives	5 Weeks
	Obstetrics and Gynecology	6 Weeks
	Pediatrics	6 Weeks
	Psychiatry	6 Weeks
	Surgery	6 Weeks
Year 4		
	Geriatrics	2 Weeks
	Clinical Electives	8 Weeks
	Emergency Medicine	4 Weeks
	Pediatrics (senior)	3 Weeks
	Surgery (senior)	6 Weeks
	Family Medicine (urban)	3 Weeks
	Review Course	3 Weeks

Time assigned for examinations has not been included

Unfortunately, most of these activities are not designed for teaching/learning of clinical medicine but rather to provide clinical care, and thus the educational value may be limited and the instruction may be opportunistic (van der Hem-stokroos et al, 2003) . When these intentional engagements or purposeful observations, are conducted without the reflective component, they are just experiences, and obviously, experience by itself does little more than confirm previously-held prejudices (MacLellan, 2005).

Clinical clerkships mostly take place in the very complex and highly demanding environment of a hospital where clinical care is the most important job by employees such as doctors, nurses, and others. Educating students in such environments becomes a challenge for doctors who are not trained to teach in any environment, and are often not rewarded for it (Reilly, 2007). This coupled with a fast-growing body of knowledge and skills related to clinical practice, has led to less effective teaching and graduates who have some documented deficiencies (Fred, 2005).

We do not know how the different teaching/learning activities in the clerkship contribute to the development of the medical student into a doctor that occurs by the end of the clinical curriculum, nor do we know how such activities interact in a way that will enhance or inhibit learning. In many ways the learning process that takes place in a clerkship is a "black box", and there have been recent calls for a much more detailed investigation of the processes that occur during this period of training. An exploration of what happens in a clerkship is clearly a legitimate task for those involved in clinical education (Schuwirth and van der Vleuten, 2006).

The majority of the research in clinical education has focused on the entire experience, but it is clear that attention needs to be paid to the individual components of the training. We are, at present, unable to answer such questions as "What characteristics make morning meetings educationally more useful?", "How much time should be spent on bedside teaching?", "What is the role of an instructor in an operating room?", or "Do students learn better in a group of students or one-on-one?"

The solution for the complexity of learning in clinical medicine lies in a good instructor utilizing the limited time of the clinical curriculum to achieve optimal student learning. The prime goal is to increase the "productive time" students spend at clinical sites so that there is an increase in their ability to carry out independent medical practice. Therefore, taking a reductionist approach, optimizing the learning time necessitates an examination of all parts of the clinical education experience. The conclusions drawn about any one component may be different from those provided by a broad overview. A component of clinical teaching that is of particular interest occurs in the presence of a patient, and is the subject of this investigation, namely, bedside teaching.

Bedside Teaching:

Bedside teaching occurs 'when a clinician takes a group of learners to the bedside of a patient, listens to the history, elicits physical signs, makes a provisional diagnosis and decides on the best diagnostic and therapeutic options'. (Nair et al, 1997). Bedside teaching is a fluid entity (Gale and Gale, 2006) occurring as a learning experience whenever students, teachers and patients interact. This interaction can range from a simple question-and-answer session to a well structured learning experience. The learning may take varying lengths of time, it may happen in an in-patient or ambulatory care setting, it may involve one-to-one teaching or involve multi-level learners at the same time, and the objectives of the instruction may range from the simplest factual re-call to more complex issues of problem solving and professional behavior. The learning experience may be conducted as part of the clinical service in which the major focus is on patient care, or in an environment where the major purpose is education and the clinical needs of the patient are attended to at other times (Table 1-2). This concept was first documented by Guilielmus, a 13th century physician who practiced bedside teaching and gave guidelines for diagnosing and treating diseases (Bonomini et al, 1997), and it is even likely to have been a part of medical teaching in the first medical schools in Greece. Centuries later, Osler suggested that medicine 'should be taught at the bedside'(Belkin and Neelon, 1992)

It is at the side of the patient, where students learn the essence of practice. They learn many of the skills required of a practicing physician, to wit, how to communicate with the patient to obtain a clear history and perform a gentle physical examination, professionalism, communication with other health professionals, application of their basic science knowledge gained earlier in their studies, application of information retrieval and management, group work dynamics, learning in groups, role modeling, managing the real patient, best utilization of time, recording clear and efficient patient notes, the best approach to investigate the problem, understanding the complexity of health problems and the existence of those problems in a larger context of family and society. Bedside teaching represents the complex clinical environment in a simpler way conductive to learning. It allows the learner to observe the teacher and interact with

Table 1-2: Main differences between protected-time (PT-BST) and clinical-service (CS-BST) bedside teaching

	Protected-time BST	**Clinical-service BST**
Group composition	Students, a homogeneous group	Staff, residents, students, nurses (a mixed group)
Instructional Planning	Usually happens	Opportunistic
Time	Specific, protected teaching/ learning time, Quantifiable	Difficult to control , Not easily quantifiable
Feedback	More constructive, Targeted and individualized	More difficult to give detailed and constructive feedback
Teaching skills of the teacher	Essential	Useful
Evaluation	Easily incorporated	Difficult to incorporate
Rewards for student success	Yes	Not usually
Listed in the Teaching Portfolio (Teaching dossier)	Yes	Not usually
Role of student	Usually active	Usually passive
Interactions with other health professions	Unlikely	Most likely
Showing the complexity of clinical practice	Unlikely	Most Likely
Type of learning it promotes	Deep learning is frequent	Variable
Skills teaching	Medical interviewing, Clinical reasoning, Communication skills, physical examination, record keeping, problem solving	The same skills, but with less intensity and more omissions

both instructor and patient, and provides an opportunity for the student to be observed by the teacher and to receive real-time feedback on their performance. Bedside teaching, if it is well planned, ensures coverage of all the clinical entities that students are required to learn by end of their program. It allows repetition of some tasks to ensure competency. It may enhance good patient care, help the student to understand the multi-professional nature of medical education and practice, and establish values for team work that will prove invaluable when the student emerges to practice in an environment where nurses and other health professionals play a key role in patient care. Finally it is important to remember that patients actually enjoy being the subject of a bedside teaching session provided that they are respected, valued and that prior consented has been obtained (Howe and Anderson, 2003).

Unfortunately, in North America, where most of our information about clinical education has been obtained (Hartley *et al*, 2003), it has been shown that during sessions at the bedside, the clinical teachers often spend little time actually teaching (Lacombe, 1997). In other parts of the world, studies have shown that students believe that insufficient time is devoted to instruction in the presence of a patient, even though the majority believes this form of instruction to be the most effective way of learning clinical medicine (Nair *et al*, 1997; Ward *et al*, 1997).

The research questions

Against this background, our main objective was to examine the most effective ways of providing bedside teaching. Despite its importance and popularity amongst learners, little empirical evidence is available on the ways in which bedside teaching can be more effective.

Studies of learning environments and factors that generate important and positive changes in the students suggest that the ability of the student, the quality of the instruction and the environment in which the learning takes place are all essential elements (Walberg, 1988). In bedside teaching, it is possible to control both the learning environment in terms of both instructor behavior and instructional process, and the setting where the teaching/learning happens. Thus to make the entire experience as valuable as possible, we require an effective teacher, an effective process of teaching and a setting that is conducive to learning. What is not at present clear is what characteristics such an instructor, process and setting should have. Accordingly, the answer to our main research question of what constitute effective bedside teaching lies in the answers to the following questions:

1- What are the characteristics of effective bedside teachers?

2- What are the characteristics of an effective bedside teaching process?

3- What are the characteristics of an effective bedside teaching setting?

Chapter II

Overview and Methodology

Whose opinion matters?

The main stakeholders in the process of bedside teaching are the teachers, students, patients, curriculum planners, other health care professionals and others such as government officials and health insurers (Snell et al, 2000). The triad of the first three stakeholders is what makes bedside teaching a unique and rich experience. Although, patients in general like participating in bedside teaching, provided that their choices are respected (Lehmann et al, 1997), the issues that concern students and teachers in bedside teaching are different from those that would be identified by the patients (Fletcher et al, 2005). The role of the patient in the process is important, but represents a separate study. We thus elected to examine the perspectives of students and teachers at this stage of research with the possibility of looking at patients' perspectives at a later stage, and perhaps also considering the views of the other stakeholders as well.

We chose final year medical students who would graduate within a few months, because they have ample experience of different bedside teachers, teaching sites, and teaching processes. They are thus in a strong position to consider the experience of bedside teaching from a perspective that is realistic and which should enable them to identify what an ideal situation would be like. We also surveyed the instructors who actually conduct the teaching and who should also have a realistic view of the entire process.
There is convincing evidence that the views of students are both valid and stable (Parsell and Bligh, 2001; Cashin, 1990), although surprisingly the perspectives of the students are rarely considered in deciding what questions are asked on evaluation forms designed to provide evidence about teachers and teaching (Ory and Ryan, 2001). As outlined in the

concluding chapter, we believe that this study will enable the views of students and teachers to be an intrinsic part of both the selection of the questions to be asked on evaluation forms for bedside teaching and the design of faculty development workshops to improve the process of bedside teaching by enhancing the skills of the teachers.

The importance of perceptions:

In educational research it is hard to separate perception from opinion, view, belief and concept, which are all based on knowledge and experience. Perception, experience and concept are interdependent and interrelated from an epistemological view. The concept on the part of students and teachers about what aspects of bedside teaching contribute to making the process a more effective method to learn clinical medicine, will influence their practice, as with any belief system (Williams et al, 2006). Therefore, an understanding of the concept of bedside teaching should enable an increased understanding of some basic elements of the bedside teaching experience. We have thus asked not what the best experience has been but what, in an ideal world, the best characteristics might be. In fact, the published research in this area often uses the terms listed above interchangeably, which makes it difficult to determine whether the authors are considering concept or experience.

Teachers' perceptions or beliefs about teaching model the way they teach (Taylor et al, 2007). A teacher who believes that the sole purpose of bedside teaching is to enhance the declarative knowledge of the students will inevitably tend to use the time at the patient' bedside to give mini-lectures, and this may be in conflict with the views of the students, who may see the experience as an opportunity to learn a skill or improve their ability to communicate with the patient. Furthermore, teachers' conceptions or beliefs about the teaching/learning process not only model their teaching approaches, but by that fact also alter the learning approaches and outcomes achieved by the students (Lowyck et al, 2004). The students' ability to adapt successfully to the learning environment at the bedside embodies both their expectations and those of the instructor (Kember, 1997). In the study that follows, we have asked about the beliefs of teachers and students in such areas as teacher-student interaction, communication, use of humor, feedback, theory content and so on. Comparing those perceptions is essential to understand what each group thinks, and may provide insight into why that concept is held. For example, if students want the teaching to be oriented towards the examination, this suggests that they see the process of evaluation as the prime objective for the exercise. This further suggests that curriculum may place an overwhelming emphasis on testing. Comparing and contrasting the views of the student-teacher dyad will help us to gain more insights into the phenomenon of effective bedside teaching. Where the views of teacher and student diverge, it seems very likely that learning will be diminished.

The perceptions of students and teachers may not be static across different methods and learning approaches in clinical education, despite some expected commonalities. One might expect, for example, that clarity on the part of the instructor would be a requirement for all successful clinical teaching, or indeed any teaching at all. Similarly one might anticipate that treating the patient with respect would be a requirement that transcends the specific leaning environment during clinical education, although the importance or weighting of the latter might differ depending on the specific nature of the environment. For example, introducing the student to the patient might be of great importance when extended bedside teaching is planned, and the entire process of setting up a fluid communication between the students and the patient might warrant half an hour on this topic alone, while at a morning ward round, where the primary purpose is to check on the progress of the patient, the entire visit may take less than five minutes and proper introduction becomes impractical.

How to measure those perceptions? Qualitative versus quantitative research methodology:

We decided to use quantitative research methodology to seek the perceptions of students and teachers about the ideal characteristics of effective bedside teaching. We thus used a well-structured, literature-based and purpose-made comprehensive questionnaire as an instrument. Although an extensive qualitative research methodology was very appealing, using such approaches as focus-groups or structured interviews, we elected to use a quantitative methodology for several reasons. First, as outlined in the next few pages, we wished to compare results from medical schools in both Oman and Canada, and we were concerned that respondents in Oman might be more reserved about expressing their ideas. Second, we would be able to obtain a much larger and possibly more representative sample using a questionnaire, and the time involved on the part of the participants would be less, making their involvement more appealing. It is also easier to compare data from different groups when a similar questionnaire is completed, and the use of a questionnaire makes it easier for replication and triangulation of research. There is no doubt that a follow-up study using appropriate qualitative methodology would provide additional data and insight.

Research sites:

Sultan Qaboos University, Muscat, Oman:

The College of Medicine and Health Sciences of Sultan Qaboos University in Oman was founded in 1986. The annual intake of the medical school is about 100 students from high school, half of whom are female, studying in a mixed-gender non-segregated environment. The medical curriculum is of a hybrid type and comprises 4 years of pre-clinical training followed by 3 years devoted entirely to clinical education. This takes place in in-patient, ambulatory and rural sites by physicians who are mostly neither full-time faculty members nor receive remuneration from the University, and in this respect the system resembles much of the clinical teaching in North America. The teaching staff are drawn from a diverse cultural, ethnic and academic background. Much of the bedside teaching, however, is conducted in a slightly different fashion from that commonly used in North America, in that the teaching-learning experience is conducted outside the requirement for patient care. In other words the medical needs of the patient are addressed at other times than during the bedside teaching experience. The instructor and the students can thus direct their entire attention to the learning situation surrounding the patient.

University of Alberta, Edmonton, Canada:

The University of Alberta, Faculty of Medicine was founded in 1913, and the number of students admitted has fluctuated considerably during its history. Currently about 130 students are admitted each year, the large majority of whom have already obtained a degree. This represents about 10% of those who meet the minimum requirements and have applied. There is no quota on gender, and for many years there were a slightly larger number of males admitted than females, although currently the division is almost exactly equal. The program is similar to most medical schools in North America and comprises two years of pre-clinical education in which the instruction uses lectures, conventional problem-based learning and some other teaching methods. This is followed by two years of clinical rotations in a conventional clerkship format, although an integrated clerkship has just been initiated for some students. An outline of the rotations during the third and fourth years of the program at Alberta will be found chapter I. Although the proportion of full-time academic staff that participates in the teaching program is higher than that at Sultan Qaboos University, a substantial proportion of the clinical teaching is conducted by "part-time" staff, some of whom receive a small remuneration, although many still teach without monetary reward. Bedside teaching is conducted almost entirely in the context of patient care. Although there are some dedicated sessions in the pre-clinical part of the curriculum in which the patient is used entirely for teaching, such as the meetings with patients that occurs in the Endocrine block in the first year of the program, these are special sessions and would not normally be considered as "bedside teaching" by the students or instructors.

Theories and Bedside Teaching:

The development of a suitable instrument for the assessment of bedside teaching started with an extensive reading of all literature related to this topic. The principles of bedside teaching are rooted in designing a powerful learning environment that stimulates active knowledge construction, problem solving and the learning of clinical skills in an authentic situation in which the care-givers work collaboratively in a team. Effective instruction will make the best use of the limited time and resources, and involve an understanding of the "community of practice" in which the students learn. In the absence of a comprehensive theory of clinical learning, it is appropriate to both inform our practice and our research by considering theories from education, sociology and psychology. These approaches, which include such things as constructivism, reflective practice, situated learning, social learning, and control of learning, cover issues that range from matters concerning the individual learner to the entire socio-cultural context that best corresponds to learning at the clinical sites. It is appropriate to provide a very brief overview of these various areas, to show how they may apply to the specific question of clinical bedside teaching and to provide an overview of the main areas that have been explored in the literature search.

Constructivism:

Constructivism is a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in. According to theorists in this field such as Dr. John Dewey, learning is the process by which individuals construct new ideas or concepts based on prior knowledge and/or experience. Therefore, each learner generates his or her own "rules" and "mental models," which are used to make sense of the experiences (Alexander, 1987). Learning, therefore, is simply the process of adjusting our mental models to accommodate new experiences. In bedside teaching, examples of the use of the constructivist theory might include structuring of the session in away to help control the learning, building on prior knowledge and so students make the link in their minds about the new experience in relation to whatever they know already, encouraging critical thinking and encouraging the students to make connections to other learning experiences to compare and contrast the experiences.

Information processing:

According to the seminal work of George Miller (1956), learning is a change in knowledge stored in memory. This concept of learning thus suggests that teaching should primarily deal with techniques to guide and support the accumulation, encoding, and retrieval process of information by students. From the perspective of this approach to learning, the design of flowcharts, algorithms and mental and physical frameworks to help the management of the cognitive load is a key feature in the appropriate instruction of students. There are plenty of illustrations of this approach in bedside teaching. The use of algorithms for patient management of such conditions as asthma and hypertension, the guided construction of appropriate notes and the “learning in context” in which the students retrieve information for use in other patients that they learned in a similar context at the bedside, are prime examples of the utilization of this theory.

Experiential learning:

The concept by David Kolb (1984) that learning is most effective when based on experience, can be interpreted in a number of different ways. In adult education, several models have been described, where the common feature is a cyclical process linking concrete experience with abstract conceptualization through reflection and planning. The theory is also often interpreted to mean that the learning experience must be connected to a "real-life" experience that may not be directly related to the exact learning that takes place, for example by teaching the principles of geometry by designing a house (Jacobson and Lehrer, 2000). Learning at the bedside with real patients embodies both of these concepts; the experience and the patient are real and are likely to have a substantially greater impact than presenting the information in a lecture or seminar. The learning becomes a 'direct encounter with the phenomena being studied rather than merely thinking about the encounter, or only considering the possibility of doing something about it.' (Borzak 1981). Furthermore, the situation of the patient who has a life outside the condition from which they are suffering and the hospital in which the learning takes place, provides the student with a variety of experiences that will help to develop their ability to help patients in the future.

Reflective practice:

As defined by Dr. Donald Schon (1983), reflective practice involves the thoughtful consideration of one's own experiences in applying knowledge to practice, while being coached by professionals in the discipline. The idea of reflective practice has been enthusiastically embraced by the medical profession (Sargeant, 2008) since it corresponds not only to learning but to patient care. Bedside teaching provides an ideal opportunity for the instructor to guide the students in considering the diagnosis and management and this process can happen both during and after the session at the bedside (in action or on action).

Social learning theory:

The social learning theory of Albert Bandura (1986) emphasizes the importance of observing and modeling the behaviors, attitudes, and emotional reactions of others. Learning by observation involves four separate processes: attention, retention, production and motivation. In the context of bedside teaching these processes correspond to learning from the role model of a professional physician in the interaction of the physician-teacher with the patient and in other aspects of medical practice. The students need to observe the behavior of their instructor, organize their thoughts about what they have seen and store the desired behavior in a fashion that can be retrieved when they encounter a similar situation. They also need to be encouraged to practice that behavior, which involves both production and motivation.

Cognitive apprenticeship and situated cognition:

Situated cognition is a theory of instruction that suggests learning is naturally tied to authentic activity, context, and culture (Brown, Collins, & Duguid, 1989). It is more difficult to learn from unnatural or artificial activities. For example, learning your first language or a foreign language by immersion is widely held to be easier than learning languages from textbooks and vocabulary lists. Cognitive apprenticeship is a model of learning based on the situated cognition theory. It provides practical steps for the application of the theory to the real business of learning. Vygotsky's concept of "zones of proximal development" suggests that to help students to learn we should design authentic tasks that are too difficult for the students to handle confidently by themselves, but not so difficult that they cannot be resolved with the support of peers or teachers who model appropriate strategies to resolve the tasks. Cognitive apprenticeship, situated learning and legitimate peripheral participation belong to the social constructivist paradigm. Lave argues that learning as it normally occurs is a function of the activity, context and culture in which it occurs (i.e., it is situated). This contrasts with most classroom learning activities which involve knowledge which is abstract and divorced from the context in which the knowledge is to be applied. Social interaction is a critical component of situated learning -- learners become involved in a "community of practice" which embodies certain beliefs and behaviors to be acquired. As the beginner or newcomer moves from the periphery of this community to its center, they become more active and engaged within the culture and hence assume the role of expert or old-timer. Furthermore, situated learning is usually unintentional rather than deliberate. These ideas are what Lave & Wenger (1991) call the process of "legitimate peripheral participation."

Other researchers have further developed the theory of situated learning. Brown, Collins & Duguid (1989) emphasize the idea of cognitive apprenticeship: "Cognitive apprenticeship supports learning in a domain by enabling students to acquire, develop and use cognitive tools in authentic domain activity. Learning, both outside and inside school, advances through collaborative social interaction and the social construction of knowledge." Brown et al. (1989) also emphasize the need for a new epistemology for learning -- one that emphasizes active perception over concepts and representation. Suchman (1988) explores the situated learning framework in the context of artificial intelligence. It is immediately obvious that in the context of clinical education in general and in bedside teaching in particular, this sort of apprenticeship is the accepted approach to undergraduate medical education.

Control Theory (Choice theory):

This theory of motivation proposed by William Glasser (1984) contends that behavior is inspired by what a person wants most at any given time: survival, love, power, freedom, pleasure or any other basic human need. The concepts are related specifically to learning but in fact can be applicable to any form of human behavior. A key point in the argument in the context of instruction is that "all we can give to another person is information". The implication is that learning is controlled from within and that the responsibility of the teacher is simply to create a climate in which the students will make the correct choice. From Glasser's perspective, there is external motivation through control by the instructor and internal motivation based on the learning choices of the students. The latter is what actually drives the real alteration in behavior that occurs as students change in response to teaching. Control/Choice theory suggests that factors that surround the internal motivation need to be the major reasons for selecting curriculum and instructional techniques. Assessment is seen only in the light of rewarding students in a fashion that accommodates their need for power and respect. While most medical educators would view this concept of education with some skepticism, there is little doubt that perceived control plays an important part in the motivation of students, and in the small group of students at the bedside of a patient, the student will be a lot more autonomous than in a classroom. A good instructor might be expected to address indirectly the needs of the students by ensuring that issues of respect, autonomy and pleasure when the students are learning at the bedside of a patient.

Adult learning:

Many consider Malcolm Knowles' andragogy theory as just unsupported axioms or assumptions without any empirical evidence (Colliver, 2002), but the theory is widely used and stated as a theoretical framework for many of the activities in medical education. The principles include the idea that adults need to know why they need to learn something before undertaking to learn it, that adults need to make their own decisions about learning strategies, that adults will use their own life-experiences to construct a learning paradigm that works for them, that learning will occur in response to a specific need to know, and that the primary motivation is the successful execution of what they have learned in a practical setting.

Some of the features advocated in adult learning theory are certainly questionable in medical education, for example some preliminary research by Misch (2002) has called into question the role of intrinsic motivation of learners in the clinical education curriculum. Despite this, in bedside teaching, the learner comes with general skills learned in the pre-clinical curriculum and elsewhere in the clerkships, and usually has adequate general experience and some knowledge of the domain of clinical practice. Most bedside teachers, however, are well aware that, plenty of domain-specific skills needed to be learned over time. Clinical education, including bedside teaching, is centered on the health concerns of people, which form the basis of problem-oriented learning. In this context, the ability of the students to be taught in a fashion which is consistent with Knowles' ideas is likely to result in effective and efficient learning of material that is of immediate relevance to the medical students.

Deliberate practice:

Ericsson et al (1993) in the extensive studies of expert performance identified common features of teaching practice that had been used with the explicit purpose of developing experts. The key issues were a well designed activity to improve performance coupled with observation and feedback with appropriate repetition to enhance learning over a period of time. This concept is allied to the cognitive apprenticeship model of learning clinical medicine, and we have used this idea in its simple form to guide our design and study of bedside teaching. The activity of teaching at the bedside is designed to improve performance of the students along much the same lines as those proposed by the Ericsson. The suggestions in this literature about the time, duration and necessity of feedback to be very informative in considering how to approach the research questions that form the basis of the work described in this thesis.

Literature Review:

The literature search of the relevant information sources such as bibliographic databases (Medline, CINAHL, ERIC, BEI, PsycINFO, TIMELIT, ASSIA, BNI, SCI) grey literature, hand searching and the Internet was performed in the Winter 2003. The keywords used individually or in combination included: medical education, undergraduate*, medical, medicine, nursing, nursing education, curriculum, clinical curriculum, tutoring, tutor*, characteristic*, behavior*, role model*, good teacher*, teacher*, excellent, supervisor*,hospital*, ambulatory teaching/learning, mentor*, evaluating, evaluation*, development, faculty development, bedside, clinical clerkship* , teaching*, tutor*, student*, medical student*, evaluation, curriculum, resident*, skill*, learning environment*, standard*, effective*, role*, student rating*, perspective*.

General:

There has been little systematic investigation of any form of approaches to bedside teaching, and almost none for the "protected-time bedside teaching" in which the entire objective is educational and the medical needs of the patient are dealt with at another time. As has been already mentioned this form of bedside teaching is popular in other parts of the world, but seldom practiced in North America, where bedside teaching is combined with attention to the care of the patient. We refer to the latter as "clinical-service bedside teaching". The handful of original investigations have either focused on a single issue, such as case presentations (Simons *et al*, 1989; Wang-Cheng *et a*l, 1989; Thomas, 1993), appropriate briefing of students (Miffin and Price, 1997), competency in physical examination (Hill and Lord 1991) or have examined only a few broad aspects of bedside teaching as a part of broader studies of clinical teaching (Irby, 1994). Several educators have written valuable articles describing research that is designed to investigate the barriers to effective bedside teaching (Nair *et al*, 1998; Ramani *et al*, 2003) and to argue the case for this educational strategy (Fitzgerald, 1990; Kroenke, 1992; Irby, 1995; Lacombe, 1997). A few theoretical models have been proposed, with a view to providing practical tips to best-practice bedside teaching (Cox, 1993; Irby, 1994; Kroenke and Omori, 1997; Ramani, 2003; Janicik and Fletcher, 2003). The Cox model is particularly appealing because it is based on a well-known constructivist theory of instructional design by Gagné (Gagné *et al*, 1988) and because it is inspired by the experiential learning model of Carl Rogers (Rogers and Freiberg, 1994).

Characteristics of effective bedside teachers:

Despite the paucity of focused research on bedside teaching, a variety of more general approaches to clinical teaching can be used to approach the problem, even though these do not explicitly address protected-time bedside teaching. Around fourteen studies published since 1966 about students perceptions on either good teachers, role models, or various aspects of clinical teachers behavior such as giving feedback (Torre et al, 2005; Elnicki et al, 2003; Roop and Bangaro, 2001; Elzubeir et al, 2001; Paukert et al, 2000,Beaudoin et al, 1998; Wright et al, 1997; Irby et al, 1991; Anderson et al, 1991; Irby et al, 1987). Kernan et al (2000) identified around 50 different behaviours of the clinical preceptors in ambulatory care surveying 3rd year medicl students. Similar scope of limited research about teachers' perceptions can be found (Buchel et al, 2005; Ker et al, 2003; Boendermaker et al, 2003; Cox et al, 2002; Cote et al, 2000; Boendermaker et al, 2000; Wright et al, 1998; Pinsky et al, 1998; Ambrozy et al, 1997; White et al, 1995; Ullian et al, 1994; Irby et al, 1994; Hilliard et al, 1990). A most important aspect of these studies was a discussion of role models in medicine, that revealed the great importance of role modeling by clinical instructors, in the education of both undergraduate medical students and residents (Wright, 1996; Wright *et al*, 1997; 1998). Based upon the assumption that it is possible to identify a general set of behaviors used by excellent clinical teachers, studies have been undertaken which have sought to identify these behaviors and then use them to design rating forms for students and residents for the purpose of evaluating clinical teachers. Frank Stritter (1975) identified six categories of effective clinical teaching behaviors including: active student participation, preceptor attitude towards teaching, emphasis on applied problem solving, student-centered instructional strategy, humanistic orientation, and emphasis on reference and research. Following this, in a series of studies, David Irby (1978, 1981, and 1991) identified six factors that were associated with clinical teaching excellence: knowledge and analytic ability, organization and clarity of presentation, enthusiasm and stimulation of interest, group interaction skills, clinical supervision skills, clinical competence, and professionalism. He found that the first four factors are common between classroom teaching and clinical medicine teaching (Irby, 1978). Building upon these studies and also incorporating ideas from general principles of learning, Kelley Skeff and colleagues (1988, 1992, and 1998) developed a faculty development program and an evaluation system to assess teacher behaviors, that is referred to as the Stanford Faculty Development Program's (SFDP's) clinical teaching framework. These behaviors clustered into seven areas: learning climate, control of the session, communication of goals, understanding and retention, evaluation, feedback, and self-directed learning. Many investigators have used these behaviors to evaluate clinical teachers through the development of instruments like " The Wisconsin Inventory of Clinic Teaching (WICT)" (Hewson and Jensen, 1990) and " The Cleveland Clinic's Clinical Teaching Effectiveness Instrument" (Copeland and Mariana, 2000) . Similar lists have also been generated within general education (Ramsden, 1992). Similar work and development of evaluation tools has been conducted in nursing education (Brown, 1981; Mogan and Knox, 1983; Knox and Mogan, 1984; Morgan, 1991). It is worth emphasizing that only a small proportion of the studies informed the design of evaluation forms of clinical teaching based on students' opinions of what is important, and the same situation exists in the specific context of bedside teaching (Williams et al, 2008). Traditionally, medical educators and administrators decide on the inclusion of whatever criteria are to be used for evaluation of teachers, and design evaluation forms for teaching ability based on those criteria. Even fewer studies discuss issues such as gender, seniority and other personal characteristics of the teacher, even though it is possible that these issues bear on the effectiveness of the bedside teaching experience. One paper by Beckman in 2004 examined clinical teaching from studies of peer observation of actual bedside teaching (Beckman, 2004). The consensus of all of these studies is not particularly surprising; undergraduate students regardless of discipline learn better under the following circumstances:

- If situations resembles real life
- If they are actively involved
- If they get constructive feedback
- If they learn in systematic and organized manner
- If they enjoy it
- If they have enough time (not too little, not too long)
- If they have positive learning environment to learn (physical and emotional)
- If they link their learning experiences and accumulate experience with time
- If their learning styles are respected and used positively to enhance learning
- If the content is pitched at an appropriate level

Characteristics of an effective bedside teaching process:

Most patients do not mind being used as the subjects for bedside teaching (Nair et al, 1997), and in fact some reports tell us that patients actually enjoy the discussion of their cases . This enthusiasm is dependent on a very careful attention to the comfort, privacy and dignity of the patient including the seeking of consent to be the subject. In general, a verbal informed consent is regarded as sufficient (Howe and Anderson, 2003) although there are some suggestions that having the patient complete a written consent form may have some advantages (Hartley et al, 2003). There is also no clear evidence of how much teaching a patient can tolerate, although this clearly depends on a variety of factors including the general healthy of the patient, and what is expected of the patient in terms of submitting to repeated histories or physical examinations. Regardless, it is recommended that both patient and learners get an appropriate introduction to each other (Schwenk and Whitman 1987). This clearly falls under the general heading of "clear communications" around the patient (Van de Wiel and Boshuizen, 1999).

Unfortunately, there is apparently no literature at all on the subject of bedside teaching in which the language of instruction differs from the language of the patient. Even in North America, this is sometimes an issue, for example in managing a Francophone patient in a predominantly Anglophone teaching hospital in Canada or a situation in which there is a substantial Hispanic population of patients in the US. World-wide the problem is much more acute. English is increasing being used as the language of instruction in medical schools, particularly those who wish to be recognized as important centres of scholarship. In this situation, one sometimes encounters the curious situation where the instruction is taking place in the second or third language of the teacher and the student, and furthermore, the discussion is entirely incomprehensible to the patient. In Oman, although English is widely spoken and is the language of instruction in the College of Medicine and Health Sciences at Sultan Qaboos University, many of the patients from rural areas only speak Arabic.

Moving from a discussion of the role of the patient in bedside teaching, we need to consider the learning process of the students. Whether we consider learning at the bedside as using a model of traditional apprenticeship, cognitive apprenticeship or deliberate practice, we end up modeling, coaching and scaffolding learners through the activity using a very careful delegation of tasks appropriate to the stage of development of the learner in both domain-specific knowledge and skills and generic skills of self-regulation and management. Aspects of this process include the modeling of an appropriate professional behavior (Wright *et al*, 1998), an appropriate organization of the learning experience (Harris, 1998), creation of an environment conducive to learning (Hutchinson, 2003), articulation of clear learning objectives (Miffin and Price, 1997), and linking of new learning to old knowledge (Schmidt *et al* , 1990). The literature is very clear that students need to be encouraged to think critically about the situation of their patient (Maudsley and Strivens, 2000), and to use a broad and holistic approach (Mauksch, 2005) coupled to an evidence-based practice (Gruppen et al, 2005). It is equally clear that the learning requires the students to compare and contrast their present learning experience with their previous learning experience and the cases they have seen previously (Klayman and Brown, 1993).

It is of great importance to understand the learner's abilities in terms of cognitive development, skills and style of learning (Vaughn and Baker, 2001) if we are to achieve a student-centered approach of teaching (Wolpaw *et al*, 2003), although the whole issue of "student-centredness" may be more complicated than at first appears. The teaching should conclude with an opportunity for reflection (Branch, 2002), an appropriate summary of the learning (Cox, 1993) and a discussion of the practical utility of what has been learned (Torre *et al*, 2003) .

While clinical bedside teaching embodies many of the requirements for any other learning experiences as outlined above, some elements that are often regarded as essential are sometimes missing. "Thinking-aloud" activities, direct observation of the learner (Holmboe, 2004), and timely constructive feedback (Kilminster and Jolly, 2000) may be rare or absent in poorly-conducted bedside teaching.

Finally, bedside teaching can provide a venue for the learning of a wide range of different clinical skills and behaviors, including history taking, physical examination), management of patients , breaking bad news , professionalism , appropriate communication , medical record management , inter-professional learning , and team work (Spencer et al,2000).

Characteristics of the bedside teaching setting:

Many studies have explored the educational environment in terms of the operations and communication conductive of learning (Roff et al, 2005). This is widely regarded as an important discussion, which lies at the heart of the identification of the teaching/learning model, which involves the teacher, learner and the context where learning happens. In contrast, few studies have looked into issues related to the general setting of bedside teaching, such as the optimum location in which the instruction should take place, the time of day at which learning is most easily achieved, how many students should be present and what other health professionals should be in the group, the duration of the experience and such issues as dress and demeanor of the participants.

According to Cox (1993) the average bedside teaching session lasts no more than 3-6 minutes but studies of deliberate practice have recommended that learning sessions that use that modality should last from 60-90 minutes and be held towards the end of the morning (Ericsson, 1993). With regard to group size, Cooper and Colleagues (1983) found no significant difference in the assessment results between groups of 4 or 8 students in a situation where 4th year clinical students were learning intensive clinical skills at the bedside. Walberg (1988) in his synthesis about educational time, recommends spacing similar learning activities for better learning.

The Instrument:

Based on the literature review a questionnaire was developed for both teachers and students, with slight modifications for each group and site. The four versions of the questionnaire, three of which were administered in a paper format and one as an electronic survey, are provided in Appendix 1. Respondents were asked to respond using a five-point Likert response system (5=strongly agree, 4=agree, 3=neither agree nor disagree, 2=disagree, 1=strongly disagree), in addition to some items that required a nominal response.

Questionnaire Development:

1- Demographics :

This section included questions about the gender of the respondent (for all groups), whether the person completing the questionnaire had an academic rank or not (for teachers), their clinical status (for teachers), and whether the person completing the questionnaire was an Omani national (for the teachers in Oman).

2- Teacher's Characteristics:

This section of the questionnaire consisted of 23-25 items all but three of which were common to all questionnaires. In some instances additional questions were asked.

Communication and behaviors:

The communication that occurs around the bedside during a teaching session could involve six different directions between any two members of the triad of teacher, student and patient. In this study, only two of these were investigated. The first was teacher-to-student communication, which ranged from simply remembering students' names to more complex issues such as giving constructive feedback. The second direction was doctor-to-patient communication, which ranged from the simply remembering the patient's name to considering the psycho-social aspect of the patient's problem. Items in this domain were taken from previously validated instruments for the evaluation of clinical teaching. Items 2-1,2-3,2-7,2-9 and 2-10 were modified from The Wisconsin Inventory of Clinical Teaching (Hewson and Jensen, 1990), Items 2-4, 2-5 and 2-11 were modified from the SFDP26 questionnaire (Litzelman, 1998), items 2 and 8 were modified from The Cleveland Clinic Clinical Teaching Idealness Instrument (Copeland and Mariana, 1992), and item 2-14 was modified from the Clinical Teacher Characteristics Instrument (Brown, 1981). The complete questionnaire will be found in Appendix 1 and the rationale and details for each section of the questionnaire is outlined in the next section.

Demographics of the ideal instructor:

This section asked the respondent for their preferences on the teacher's gender, his/her nationality (for students and teachers in Oman only), his/her spoken language (for students and teachers in Oman only) , his/her clinical status (for teachers), and his/her academic rank (for all but students in Canada). We believed that these characteristics might be seen as important contributions to the ideal learning experience, particularly in Oman where medicine is often practiced by expatriate doctors who seldom speak the language of their patients. Teaching and practice is conducted in English, although the first language of both patients and students is Arabic. Items in this category were not taken from a specific instrument though some research has alluded to their possible significance (Ypinazar & Margolis, 2004; Findlow, 2006). Students in Canada have no way to confirm the academic rank of their clinical teachers; accordingly that item was removed from their questionnaire.

3- General setting:

This section consisted of 13-15 items. Each item in this section was developed to answer simple questions about the preferred site for bedside teaching, the number of sessions per week, the number of students per group, the gender of members of the group (for the Omani group only), whether it was desirable to have the same teacher for the entire clerkship, whether the students wearing a white coat was important or not, whether it was preferable that the students be seated at the side of the patient, and whether the presence of a nurse, or of a family member was desirable during the teaching. Participants in the survey were also asked about the preferred duration of the bedside teaching session. Items about feedback were also included in this section. Respondents used either a five-point Likert response system (5=strongly agree, 4=agree, 3=neither agree nor disagree, 2=disagree, 1=strongly disagree) or a nominal response depending on the item in question.

4- Bedside Teaching Process:

This section consisted of 46 items. Each item was designed to measure one or more of the issues identified in the literature review. A theoretical organizational model for bedside teaching suggested by Cox (1993) was used to organize the items in the instrument. The items were constructed specifically for this questionnaire, since no appropriate instrument was already available. The only demographic variable collected was the gender of the individual completing the questionnaire. With the exception of Item 4-27 which was concerned with the duration of the session and Item 4-46 which asked the student to reflect on the appropriateness of the questionnaire to elicit information about bedside teaching, the remaining 44 items were all concerned with student perceptions of different domains of the process of bedside teaching itself. Students were asked to respond using a five-point Likert response system (5=strongly agree, 4=agree, 3=neither agree nor disagree, 2=disagree, 1=strongly disagree).

Validity:

The questionnaire was the first to examine the areas of bedside teaching described above. In order to provide a small scale validation, the questionnaire was reviewed for it appropriateness by three respected members of the international medical education community:

1- **Dr. Cees van del Vleuten**, Scientific Director, School of Health Professions Education and Chair, Department of Educational Development and Research, Faculty of Health, Medicine and Life Sciences, Maastricht University, Netherlands:

   He suggested minor modifications and suggested that best approach was to do semi-structured interviews, a suggestion which was discussed at length and which may be adopted in further studies. For reasons outlined earlier, we ultimately decided to use a quantitative approach involving a survey.

2- **Dr. Karen Mann**, Head of the Division of Medical Education, Dalhousie University:

   She praised the comprehensiveness of the study instrument, suggested minor modifications of the questionnaire, and suggested factor analysis as a prime method to analyze results.

3- **Dr. Stephen Brigley**, Senior Lecturer in Medical Education and Course Director, Postgraduate Certificate in Medical Education, School of Postgraduate Medical and Dental Education, Cardiff University, UK :

   He suggested few minor modifications to the questionnaire.

Where modifications were suggested they were adopted; the questionnaire provided in the appendix includes these suggestions. A full discussion of the psychometric features of the instrument is to be dealt with in future research.

Piloting:

The questionnaire was piloted on a group of eight students in Oman who were permitted to make open-ended comments on the questions. The main purposes were to check the time needed to complete the questionnaire, which was found to be 10-15 minutes on average, and to resolve any linguistic ambiguity. No piloting was carried out on groups of students or teachers in Canada because all have good command of English. The same group of students was involved in the study later since no contamination is expected simply because this is a study of expectations, and those are generally stable over short times.

Ethics Approval:

The respondents received letters from the researchers explaining the project in terms of intent, goal, confidentiality, anonymity, voluntary participation and venues where the research is going to be published. In Oman, a separate letter from the Dean of College of Medicine and Health Sciences was received by the respondents.

The research was approved by the Ethics Committee at the College of Medicine and Health Sciences, Sultan Qaboos University, Oman and by the Health Research Ethics Board of the University of Alberta.

Statistical Analysis:

The raw data was analyzed using SPSS to obtain:

1- Descriptive statistics: mean, standard deviation of the mean, median, and percent responses.

2- Exploratory factor analysis on some parts of the data.

3- Comparison between the responses of different groups to the items: Nominal data were compared using the χ^2 test. Likert-type items were usually compared using the Kolmogorov-Smirnov test but an independent sample *t*-test, Mann-Whitney test, and χ^2-test were also used as appropriate. A probability of less than 0.05 was considered significant. .

Results:

Tables 2-1, 2-2, 2-3, 2-4, and 2-5 represent all data comparing all groups. In the publications that follow this chapter, some of the information is presented in a slightly different fashion.

Table 2-1: Demographics*

Demographic:	SQU Students	UofA Students	SQU Teachers	UofA Teachers
Number of respondents	130	84	38	57
Female gender	60	42	3	22
Male gender	62	34	35	35
Staff member or equivalent	-	-	32	57
Resident or equivalent	-	-	5	0
Have a full-time academic position	-	-	4	45
Omani National	-	-	27	-

***: Some of the numbers do not add up to totals because of missing responses**

Table 2-2: Effective Bedside Teachers

Items¶ : (from the students' questionnaire) *(from the teachers' questionnaire, where the phrasing is different)* The ideal teacher in a BST experience would: *(I would like the teacher in BST to) :*	**SQU** Students	**UofA** Students	**SQU** Teachers	**UofA** Teachers
Be male [1,2]	3.68±0.08	2.96±0.05	2.41±0.18	2.73±0.10
Be female[1,2]	3.20±0.08	2.95±0.05	2.32±0.16	2.73±0.10
Be a resident[1,3] ***Be a junior doctor*** *(Oman groups only)*	3.19±0.11	3.56±0.08	2.89±0.20	2.87±0.11
Be a staff member[1,2,3,4] ***Be a senior doctor*** *(Oman groups only)*	4.44±0.08	3.90±0.08	3.95±0.16	3.39±0.12
Have a full time-academic position[2] *(all groups except students in Alberta)*	3.98±0.10	-	2.71±0.17	2.59±0.10
Speak Arabic *(Oman only)*	3.27±0.10	-	2.89±0.20	-
Speak the language of the patient	3.85±0.08	3.96±0.09	3.58±0.18	4.07±0.09
Be a good listener	4.55±0.06	4.45±0.06	4.71±0.07	4.67±0.07
Remind students of exams/tests to come [1,2,3,4] ***Remind me of exams/tests to come***	4.25±0.07	3.75±0.09	3.47±0.20	2.89±0.14
Consider the psychsocial aspect of the patient's illness[1]	4.56±0.06	4.14±0.08	4.74±0.07	4.49±0.07
Use humour during teaching	4.22±0.07	4.12±0.07	4.37±0.10	3.96±0.09
Stress mostly the theoretical rather than practical issues around the case[1,2]	3.21±0.14	2.24±0.07	2.43±0.16	2.05±0.07
Guide students to the sources of information they will need [1] ***Guide me to the sources of information I will need.***	4.69±0.06	4.06±0.06	4.42±0.10	4.14±0.08

¶ : Median value of responses is presented for each group
1 : Significant statistical difference exists between SQU students and UofA students for this item using K-S test.
2 : Significant statistical difference exists between SQU students and SQU teachers for this item using K-S test.
3 : Significant statistical difference exists between UofA students and UofA teachers for this item using K-S test.
4 : Significant statistical difference exists between SQU teachers and UofA teachers for this item using K-S test.

Table 2-2 (continued): Effective Bedside Teachers

Items¶ : (from the students' questionnaire) *(from the teachers' questionnaire, where the phrasing is different)* The ideal teacher in a BST experience would: *(I would like the teacher in BST to) :*	**SQU** Students	**UofA** Students	**SQU** Teachers	**UofA** Teachers
Be approachable	4.81±0.05	4.67±0.05	4.58±0.08	4.61±0.07
Be a good communicator with the patient	4.84±0.05	4.63±0.05	4.76±0.08	4.82±0.05
Use simple and clear language[1]	4.85±0.05	4.49±0.07	4.87±0.06	4.74±0.06
Give students constructive feedback on their performance[1] ***Give me constructive feedback on my performance***	4.80±0.06	4.55±0.05	4.76±0.07	4.65±0.07
Respect the confidentiality of the patient[1,3]	4.79±0.06	4.33±0.07	4.89±0.05	4.79±0.06
Encourage students to think critically[1] ***Encourage me to think critically.***	4.77±0.06	4.50±0.05	4.79±0.07	4.70±0.07
Guide students to areas of further learning in relation to the patient's problem(s)[1,3] ***Guide me to areas of further learning in relation to the patient's problem(s).***	4.77±0.05	4.25±0.06	4.71±0.07	4.54±0.07
Teach students how to write patient notes [1,4] ***Teach me how to write patient notes.***	4.74±0.06	3.85±0.09	4.58±0.08	4.11±0.09
Refer to the patient by his/her illness [1,2]	2.66±0.11	2.08±0.09	1.89±0.19	1.65±0.10
Remember student's names. ***Remember my name.***	4.01±0.07	4.12±0.08	3.95±0.12	4.21±0.09
Remember the patient's name[3]	4.27±0.07	4.23±0.07	4.39±0.10	4.65±0.06
Be Omani national[2] *(for Oman only)*	3.39±0.08	-	2.67±0.14	-

¶ : Mean± Standard Error of the Mean value of responses is presented for each group
1 : Significant statistical difference exists between SQU students and UofA students for this item using K-S test.
2 : Significant statistical difference exists between SQU students and SQU teachers for this item using K-S test.
3 : Significant statistical difference exists between UofA students and UofA teachers for this item using K-S test.
4 : Significant statistical difference exists between SQU teachers and UofA teachers for this item using K-S test.

Table 2-3: Bedside Teaching Setting -1

Items *(with their response choices)*	**Responses#** Sultan Qaboos University students and (teachers)∞ ***University of Alberta student and (teachers)****			
I prefer the duration of the entire BST to be: (give range in minutes or hours) *(Average in minutes with 95% confidence interval))*	59.88 (54.30,65.47) / 55.35 (49.10,61.60) ***36.12 (31.02,41.22) / 52.18 (41.99,62.37)***			
What is the best time for BST? *1.Morning 2.Afternoon 3.Either*	66.9% (57.9 %) ***17.9% (12.5%)***	10.8% (5.3%) ***7.1% (7.1 %)***	22.3% (34.2 %) ***75.0% (80.4%)***		
Whereabouts is BST best offered? *1.An outpatient setting 2.An in-patient setting 3.Either*	2.3% (5.4%) ***1.2% (5.4%)***	97.7% (94.6%) ***20.2% (7.1%)***	0.0% (0.0%) ***78.6% (87.5%)***		
How many bedside teaching sessions should be held each week? *1.1-2 2.3-4 3.5-6 4.The more the better*	1.5% (23.7%) ***9.6% (30.2%)***	23.1% (50.0%) ***41.1% (26.4%)***	9.2% (13.2%) ***8.4% (15.1%)***	66.2% (13.2%) ***41.0% (28.3%)***	
What is the ideal number of students for a BST session? *1.1-3 2.4-6 3.7-9 4.10-12 5.Any number*	48.8% (13.2%) ***81.9% (83.9%)***	42.6% (84.2%) ***16.9% (12.5%)***	7.0% (2.6%) ***0.0% (0.0%)***	0.0% (0.0%) ***1.2% (0.0%)***	1.6% (0.0%) ***0.0% (3.6%)***

#: Responses in the same order of response choices for each item.
∞: Responses from Sultan Qaboos University- upper row of each cell.
*: Responses from University of Alberta- lower row of each cell

Table 2-4: Bedside Teaching Setting -2

Items / **Responses**	Strongly agree	Agree	Neither	Disagree	Strongly disagree
It is best if one teacher instructs all BST sessions for the entire clerkship[1,2,3,4]	*10.1 (5.3)∞* **2.4 (21.4)¥**	*31.8 (2.6)* **10.7 (57.1)**	*7.8 (0.0)* **19.0 (14.3)**	*24.8 (36.8)* **42.9 (5.4)**	*25.6 (55.3)* **25.0 (1.8)**
The in-charge nurse of the patient should attend the BST[1]	*11.5 (2.6)* **2.4 (1.8)**	*42.3 (31.6)* **13.3 (21.8)**	*20.0 (15.8)* **31.3 (38.2)**	*21.5 (42.1)* **38.6 (30.9)**	*4.6 (7.9)* **14.5 (7.3)**
BST is best carried out if patient's family member(s) are NOT present[1,2,4]	*53.1 (18.4)* **8.4 (5.6)**	*33.1 (55.3)* **42.2 (29.6)**	*9.2 (10.5)* **41.0 (35.2)**	*1.5 (13.2)* **8.4 (27.8)**	*3.1 (2.6)* **0.0 (1.9)**
I prefer to be seated at the bedside during the teaching[1] *(students only)*	*11.5* **7.1**	*39.2* **20.2**	*11.5* **47.6**	*24.6* **23.8**	*13.1* **1.2**
I prefer to wear white coat during BST[1] *(students only)*	*36.9* **2.4**	*41.5* **14.3**	*14.6* **39.3**	*4.6* **32.1**	*2.3* **11.9**
I prefer the group to be composed of same gender[2] *(Oman only)*	*17.7 (5.3)*	*20.8 (10.5)*	*21.5 (18.4)*	*27.7 (39.5)*	*12.3 (26.3)*

∞: Percentage of responses from Sultan Qaboos University students and (teachers).
¥: Percentage of responses from University of Alberta students and (teachers)
1: Significant statistical difference exists between SQU students and UofA students for this item using K-S test.
2: Significant statistical difference exists between SQU students and SQU teachers for this item using K-S test.
3: Significant statistical difference exists between UofA students and UofA teachers for this item using K-S test.
4: Significant statistical difference exists between SQU teachers and UofA teachers for this item using K-S test.

Table 2-5: Bedside Teaching Process

Items¶ : (from the students' questionnaire) *(from the teachers' questionnaire)*	**SQU** Students	**UofA** Students	**SQU** Teachers	**UofA** Teachers
4.1 I would like my teacher to know my background and abilities in terms of knowledge and skills before the BST session. *The teacher should know the background and abilities of his/her students in terms of knowledge and skills, before the BST session.*	4.03±0.08	3.88±0.08	4.08±0.15	3.94±0.08
4.2 I would like the teacher to inform the patient about the BST beforehand *The teacher should inform the patient about the BST session beforehand* [1,2]	4.45±0.06	4.19±0.07	4.42±0.11	4.35±0.11
4.3 I would like the teacher to have the patient sign consent form agreeing to be involved in any BST *The teacher should have the patient sign a consent form agreeing to any BST* [1]	3.28±0.10	2.58±0.09	2.50±0.18	2.60±0.14
4.4 I would like the teacher to inform the patient about the nature of the BST that will occur *The teacher should inform the patient about the nature of the BST that will occur*	4.24±0.07	4.07±0.06	4.11±0.13	4.18±0.10
4.5 I would like the teacher to ask the patient's agreement to the physical examination to be carried out on him/her. *The teacher should ask the patient's agreement to the physical examination to be carried out on him/her*	4.32±0.07	4.35±0.07	4.47±0.09	4.53±0.09
4.6 The teacher should, in advance, inform the in-charge nurse that BST will take place *The teacher should, in advance, inform the in-charge nurse that BST will take place*[1,3]	3.95±0.08	3.00±0.10	3.97±0.14	3.57±0.13
4.7 The teacher should be part of the patient's management team. *The teacher should be part of the patient's management team.*[1,2,3]	4.28±0.07	3.61±0.08	3.35±0.16	3.04±0.14
4.8 I would like the teacher to tell me explicitly what I am expected to learn from this BST experience *The teacher should tell the students explicitly what they are expected to learn from the BST experience*[1]	4.34±0.06	3.82±0.08	4.08±0.14	3.55±0.13

¶ : Mean± Standard Error of the Mean value of responses is presented for each group
1 : Significant statistical difference exists between SQU students and UofA students for this item using K-S test.
2 : Significant statistical difference exists between SQU students and SQU teachers for this item using K-S test.
3 : Significant statistical difference exists between UofA students and UofA teachers for this item using K-S test.
4 : Significant statistical difference exists between SQU teachers and UofA teachers for this item using K-S test.

Table 2-5 (Continued): Bedside Teaching Process

Items¶ : (from the students' questionnaire) (*from the teachers' questionnaire)*	**SQU** Students	**UofA** Students	**SQU** Teachers	**UofA** Teachers
4.9 I would like the teacher to inform me of any special characteristics of the patient before the session *The teacher should tell the students about any special characteristics of the patient before seeing him/her(characteristics such as demented, blind...etc)*	3.96±0.09	3.95±0.08	4.05±0.14	3.84±0.13
4.10 I prefer to have no prior clinical information about the patient before seeing him/her *I would prefer that the students have no prior clinical information (history, findings and/or diagnosis) about the patient before seeing him/her*[1]	3.78±0.11	2.69±0.11	3.11±0.20	2.71±0.13
4.11 I would like the teacher to introduce me to the patient by my name *The teacher should introduce the students to the patient by their names.*	4.07±0.06	4.21±0.07	3.97±0.14	4.20±0.10
4.12 I would like the teacher to introduce the patient to me *The patient should be introduced to the students by the teacher.*	4.08±0.07	4.30±0.07	4.41±0.13	4.36±0.08
4.13 I prefer to communicate in simple language to any questions asked by the patient *The teacher should communicate in simple (non-medical) language any questions from the patien*[2]	4.32±0.06	4.29±0.06	4.68±0.08	4.34±0.10
4.14 The teacher should allow me to ask him/her questions during the session *I would like the students to ask me questions during the session.*	4.48±0.06	4.30±0.07	4.41±0.08	4.16±0.09
4.15 I would like the teacher to ask me questions during the patient encounter *The teacher should ask questions of the students during the session at the bedside.*	4.02±0.08	3.83±0.08	4.24±0.11	4.06±0.10
4.16 I would like the teacher to stress theoretical knowledge during this patient encounter *The teacher should stress theoretical knowledge during this patient encounter.*[1,2,4]	2.88±0.12	3.12±0.10	2.11±0.14	2.70±0.11
4.17 I would like the teacher to give me time to take notes during this patient encounter *The students should be given time to take notes during the bedside teaching experience.*[1,2,4]	3.75±0.08	2.86±0.09	1.89±0.12	2.80±0.13
4.18 I would like the teacher to demonstrate his/her communication skills with the patient *It is important that the teacher demonstrates their communication skills with the patient.*	4.35±0.05	4.05±0.08	4.11±0.12	4.41±0.09

¶ : Mean± Standard Error of the Mean value of responses is presented for each group
1 : Significant statistical difference exists between SQU students and UofA students for this item using K-S test.
2 : Significant statistical difference exists between SQU students and SQU teachers for this item using K-S test.
3 : Significant statistical difference exists between UofA students and UofA teachers for this item using K-S test.
4 : Significant statistical difference exists between SQU teachers and UofA teachers for this item using K-S test.

Table 2-5 (Continued): Bedside Teaching Process

Items¶ : (from the students' questionnaire) *(from the teachers' questionnaire)*	**SQU** Students	**UofA** Students	**SQU** Teachers	**UofA** Teachers
4.19 The session at the bedside should stress history and physical ONLY *The session at the bedside should stress history taking and physical examination ONLY.*[1,2]	3.08±0.12	2.62±0.09	2.54±0.18	2.72±0.16
4.20 I would like the teacher to discuss investigations and management at bedside *The teacher should discuss investigations and management at the bedside.*[1,2,3]	3.62±0.12	3.75±0.08	2.95±0.19	3.08±0.14
4.21 I would like the teacher to allow me to present the case *I would like a student to present the case.*[1,2]	4.55±0.05	3.56±0.08	4.14±0.12	3.68±0.10
4.22 I would like the teacher to guide me as I elicit the physical signs *The students should receive guidance from the teacher as they elicit the physical signs.*[1]	4.46±0.07	4.05±0.08	4.43±0.08	4.12±0.07
4.23 I would like the teacher to allow me to think aloud and describe what I feel during the physical examination *I would like the students to think aloud and describe what he/she feels during the physical examination.*[1]	4.40±0.06	3.95±0.07	4.22±0.12	3.66±0.11
4.24 I would like the teacher to observe me taking history from the patient *The teacher should observe the student taking the history from the patient*[1,3]	3.74±0.11	3.50±0.10	3.73±0.19	4.06±0.09
4.25 I should thank the patient at the end of the teaching *The students should thank the patient at the end of the teaching.*	4.71±0.05	4.62±0.06	4.92±0.05	4.78±0.06
4.26 I would like to go back to the patient when the teacher is not there, to practice physical examination *Ideally, I would like the students to go back to the patient when I am is not there, to practice physical examination.*[1,4]	4.02±0.07	3.11±0.10	3.76±0.15	2.92±0.15
4.27 I prefer the duration of this patient encounter to be (1: < 30 minutes 2: 30-60 minutes 3: >60 m) *I prefer the duration of this patient encounter to be*[1,4]	1.90±0.04	1.43±0.05	1.83±0.06	1.43±0.08
4.28 I would like the teacher to point out explicitly what we learnt from the patient encounter *The teacher should point out what the students should have learnt from this patient encounter.*[1]	4.50±0.05	4.18±0.06	4.39±0.09	4.14±0.08

¶ : Mean± Standard Error of the Mean value of responses is presented for each group
1 : Significant statistical difference exists between SQU students and UofA students for this item using K-S test.
2 : Significant statistical difference exists between SQU students and SQU teachers for this item using K-S test.
3 : Significant statistical difference exists between UofA students and UofA teachers for this item using K-S test.
4 : Significant statistical difference exists between SQU teachers and UofA teachers for this item using K-S test.

Table 2-5 (Continued): Bedside Teaching Process

Items¶ : (from the students' questionnaire) *(from the teachers' questionnaire)*	**SQU** Students	**UofA** Students	**SQU** Teachers	**UofA** Teachers
4.29 I would like the teacher to summarize history and physical examination findings and organize them logically for us *It is the responsibility of the teacher to summarize the history and examination findings and organize them logically for the students*[1,3,4]	4.50±0.06	4.18±0.08	4.08±0.15	2.80±0.12
4.30 I would like the teacher to help me summarize what I have learned *Ideally, I prefer that the students summarize the findings and organize them.*[1,4]	4.60±0.05	4.08±0.07	4.50±0.12	4.02±0.11
4.31 I would like the teacher to give me immediate feedback about my performance *The students should receive immediate feedback about their performance.*[1]	4.48±0.05	3.98±0.07	4.08±0.14	4.14±0.09
4.32 I would like the teacher to allow my fellow students to give me immediate feedback about my performance. *Ideally, the students should give each other immediate feedback on their performance.*[1,2]	4.06±0.09	3.23±0.10	3.19±0.16	3.55±0.15
4.33 I would like the teacher to correct any misconceptions or doubts I have. *The teacher should correct any misconceptions and doubts the students may have.*[1]	4.62±0.06	4.14±0.07	4.47±0.09	4.35±0.07
4.34 I would like he teacher to encourage me to think critically about the patient encounter. *The students should be asked to think critically about the patient encounter.*[1]	4.42±0.07	4.26±0.06	4.39±0.09	4.33±0.08
4.35 I would like the teacher to encourage me to discuss information gained from other patients, as it bears on the patient that we saw. *The students should have the opportunity to discuss information gained from other patients, as it bears on the patient that they saw.*[1,2]	4.31±0.06	4.10±0.05	3.67±0.14	4.31±0.08
4.36 I would like the teacher to explain the pathophysiological basis of the patient's problem(s). *The teacher should explain the pathophysiological basis of the patient's problem(s).*[1]	4.29±0.08	4.25±0.06	4.14±0.11	3.86±0.12
4.37 I would like the teacher to discuss how to investigate and manage such a patient *The teacher should discuss how to investigate and manage such a patient.*[1]	4.62±0.05	4.40±0.06	4.39±0.13	4.08±0.10
4.38 I would like the teacher to guide me as to how this case relates to basic science knowledge. *The teacher should guide the students as to how this case relates to basic science knowledge.*[1]	4.57±0.06	3.78±0.09	4.36±0.10	3.88±0.11

¶ : Mean± Standard Error of the Mean value of responses is presented for each group
1 : Significant statistical difference exists between SQU students and UofA students for this item using K-S test.
2 : Significant statistical difference exists between SQU students and SQU teachers for this item using K-S test.
3 : Significant statistical difference exists between UofA students and UofA teachers for this item using K-S test.
4 : Significant statistical difference exists between SQU teachers and UofA teachers for this item using K-S test.

Table 2-5 (Continued): Bedside Teaching Process

Items¶ : (from the students' questionnaire) *(from the teachers' questionnaire)*	**SQU** Students	**UofA** Students	**SQU** Teachers	**UofA** Teachers
4.39 I would like the teacher to inform me of the evidence in the literature to support the management plan. *The teacher should inform the students about the evidence in the literature that supports the management plan.*[1]	4.43±0.05	4.10±0.07	4.28±0.14	4.04±0.10
4.40 I would like the teacher to tell me about his/her experience(s) with similar patients. *It is useful if the teacher tells the students about his/her own experiences with similar patients.*[1]	4.42±0.06	4.06±0.07	4.06±0.14	3.98±0.09
4.41 I would like the teacher to help me identify the key learning outcomes from this BST experience. *The teacher should help the students to identify the key learning issues from the BST experience.*[1]	4.54±0.05	4.17±0.06	4.36±0.10	4.20±0.08
4.42 I would like the teacher to conclude some guidelines for encounters with future patients. *The teacher should conclude the session with some guidelines for encounters with future patients.*[1]	4.42±0.06	4.20±0.06	4.17±0.12	3.98±0.09
4.43 I would like the teacher to help me to devise a flowchart, working plan or an algorithm for future patient encounters. *The students should be encouraged by the teacher to design a flowchart, working plan or algorithm for future patient encounters.*[1,2,4]	4.44±0.06	3.72±0.11	3.92±0.12	3.18±0.14
4.44 I would like the teacher to give me a written material summarizing the things I learnt from this BST. *The students should receive written material from the teacher summarizing the things they learned from this BST.*[1,2,4]	3.96±0.09	3.71±0.09	2.71±0.17	2.51±0.11
4.45 I think it is important to thank my teacher for his/her effort. *Ideally, I would like students to thank me for my efforts*[2,3,4]	4.62±0.05	4.51±0.06	2.92±0.14	3.82±0.11
4.46 I think these steps of BST would be an effective and practical system for examining the bedside teaching process. *I think these seven steps of BST would be an effective and practical system for examining the bedside teaching process.*[1,2]	4.55±0.06	4.10±0.07	4.15±	3.85±0.09

¶ : Mean± Standard Error of the Mean value of responses is presented for each group
1 : Significant statistical difference exists between SQU students and UofA students for this item using K-S test.
2 : Significant statistical difference exists between SQU students and SQU teachers for this item using K-S test.
3 : Significant statistical difference exists between UofA students and UofA teachers for this item using K-S test.
4 : Significant statistical difference exists between SQU teachers and UofA teachers for this item using K-S test.

Conclusions:

The publications or submissions that follow this chapter outline some of the results obtained from this survey and make explicit the conclusions we can draw from the responses of the various groups. The conclusions from the individual papers and the other information that we have gained is outlined in the concluding chapters of this thesis.

Chapter III

Students' perception of the characteristics of effective bedside teachers[1]

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[1] A version of this chapter has been published: Al Weshahi A, Harley, D. and Cook, D.A. Students' perception of the characteristics of effective bedside teachers Medical Teacher 29: 204-209 (2007)

Introduction:

Medical students learn the craft of medicine in part through a cognitive apprenticeship model (Dolmans *et al*, 2002), in which a day-to-day clinical experience helps the student to develop needed skills and knowledge. Unfortunately, little is known about the factors that determine a positive learning experience during this phase of education (Van der Hem-Stokroos *et al*, 2003), and even less is known about the contribution of individual learning practices such as seminars, teaching rounds or bedside teaching (BST). There is thus a need to determine ways to make clinical learning more effectivel, in order to developing a more evidence-based teaching practice.

For learning to happen in the clinical environment, the student must have a teacher, learning material and an environment where this process takes place. Evidence suggests that the interaction between these factors determines student learning (Stern *et al*, 2000; Roop & Pangaro, 2001). Thus, the learning that takes place during clinical teaching/learning experiences depends at least in part, on the teacher and his/her characteristics.

In 1975, Stritter identified six ideal clinical teaching behaviours: active learning, preceptor attitude towards teaching, emphasis on problem solving, student-centered instructional strategy, humanistic orientation, and emphasis on research. Irby and co-workers (1978, 1991) identified six factors that were associated with clinical teaching excellence: knowledge, organization, enthusiasm, supervision skills, clinical competence, and professionalism. He found that the first four factors are shared by both classroom teaching and teaching in the clinical setting (Irby, 1978). Skeff and colleagues (1992) developed an evaluation system to assess teacher behaviours, and identified seven areas:

learning climate, control of session, communication of goals, understanding and retention, evaluation, feedback, and self-directed learning. It is not clear whether the skills identified by any of these approaches are necessary or sufficient to describe excellence in any specific area of clinical teaching.

Any teaching in the presence of a patient may be called "Bedside Teaching" and can occur as part of the clinical service during ward rounds (the predominant model in North America) or be designed expressly as teaching exercise, without a component of patient care (as in many schools in the Arab world). There has been little systematic investigation of either of these approaches. The investigations have either focused on a single issue, such as case presentations (Simons *et al*, 1989), appropriate briefing of students (Miffin and Price, 1997), physical examination (Hill and Lord 1991) or have examined a few broad aspects of BST as part of a more general investigation of clinical teaching (Irby, 1994a). A few theoretical models have been proposed, with a view to providing practical tips to best-practice bedside teaching (Cox, 1993; Irby, 1994b; Ramani, 2003; Janicik and Fletcher, 2003).

It has been shown that students are able to identify skilled teachers, and that they learn more from those that they identify (Griffith, 2000; Shea and Bellini, 2002). The information from student evaluations is considered valid and reliable (Cashin, 1995). We thus used student opinion as the chief source of information. As mentioned, there have been some investigations of existing experiences, but few have addressed the ideal experience – what would make the learning in BST optimal. Since evaluation is the result of the relationship between expectations and experience, assessment of what occurred may not be a completely reliable method for collecting information. We thus asked the students to conceptualize the learning experience in terms of ideal behaviours especially those concerned with communication. One might also suppose that issues such as gender, language, presence of academic rank and clinical title of the teacher might play a role in determining the students' concepts of the ideal BST experience, especially in a student body from a traditional Arabic culture. We thus wished to determine the key features of the ideal BST experience, with respect to the personal and cultural characteristics of the teacher.

Methods:

Context of the study:

The study was conducted at of The College of Medicine and Health Sciences of Sultan Qaboos University, Oman, where the curriculum is of a hybrid type and comprises 4 years of pre-clinical training followed by 3 years devoted to clinical education, which takes place in in-patient, ambulatory and rural sites. The teachers are physicians but are mostly unpaid, and in this respect the system resembles much of the clinical teaching in North America. The teaching staff are drawn from a diverse cultural, ethnic and academic background.

Instrument:

From published reports of student evaluation of teaching, items were developed in the following two domains:

1- **Communication:** The communication around the bedside could involve six different directions between any two members of the triad of teacher, student and patient. In this study, only two of these were investigated. The first was teacher-to-student communication, which ranged from simply remembering students' names to more complex issues such as giving constructive feedback. The second direction was doctor-to-patient communication, which ranged from simply remembering the patient's name to considering the psycho-social aspect of the patient's problem. Items in this domain, which we refer to as the "Communication" domain, were taken from previously validated instruments for the evaluation of clinical teaching. Items 1,3,7,9 and 10 were modified from The Wisconsin Inventory of Clinical Teaching (Hewson and Jensen, 1990), Items 4, 5 and 11 were modified from the SFDP26 questionnaire (Lizelman et al., 1998), items 2 and 8 were modified from The Cleveland Clinic Clinical Teaching Effectiveness Instrument (Copeland and Mariana, 1992), and item 14 was modified from the Clinical Teacher Characteristics Instrument (Brown, 1981).

2- **Demographics:** This section included such issues as gender, nationality, spoken language, his/her clinical status, and his/her academic rank. We believed that these characteristics might be seen as important contributions to the ideal learning experience, particularly at our site where medicine is often practiced by expatriate doctors who seldom speak the language of their patients. Teaching and practice is conducted in English, although the first language of both patients and students is Arabic. Items in this category were not developed from a specific instrument though some research has alluded to their possible significance (Ypinazar & Margolis, 2004; Findlow, 2006).

A 25-item questionnaire was developed. The only demographic information collected was the gender of the individual completing the questionnaire. The remaining 24 items were concerned with the perceptions of the ideal BST teacher. Students were asked to respond using a five-point Likert scale (5=strongly agree, 4=agree, 3=neither, 2=disagree, 1=strongly disagree). In order to provide validation for the instrument, the questionnaire was reviewed independently by three established international experts of whom two suggested minor modifications, and was piloted on a small group of students who were permitted to make open-ended comments on the questions.

The students received letters from the Dean and the investigator explaining all aspects of the study, that they would be permitted to see the results, and explicitly guaranteeing personal anonymity. The project was approved by the Ethics Review Board of Sultan Qaboos University.

Subjects:

Eighty-four final year medical students in the academic year 2003/2004 received the questionnaire. The questionnaires were delivered by the student representative who volunteered to distribute and collect the completed questionnaires.

Statistical Analysis:

Mean and standard deviation were calculated for each item. The significance of inter-gender difference was determined using the Student's *t*-test for single items and for all indices created.

A Teacher Characteristics' Index (TI) was computed using the sum of all items except the demographic data. The correlation coefficient (r) between each item and the TI were computed and corrected for the whole-part condition. The strength of the correlation was interpreted using the scale suggested by Cohen (1988) where $r > 0.5$ is considered as being a strong correlation, $0.3 < r < 0.5$ as being a moderate correlation, $0.1 < r < 0.3$ as being a weak correlation and $r < 0.1$ as being trivial.

We followed the recommendation of Hutcheson & Sofroniou (1999) that viable factor analyses can be carried out on much smaller numbers than the 150 cases mentioned by Tabachnick & Fidell (1996), accordingly, a "little Jiffy" (Kaiser, 1970) factor analysis was performed to identify any significant factors, which were selected on the basis of Kaiser-Guttman criteria and Cattell's scree plot. Items were assigned to factors based on the maximum factor loading.

Results:

All final year medical students in the academic year 2003/2004 received the questionnaire. 50% of the students were female, as required by the admission policy at the Sultan Qaboos Medical School. The response rate was 74% and there were no significant differences in the responses between male and female students. Cronbach's α was 0.67 for all items.

All but two of the items designed to measure the "Communications and Behaviours" domain had a mean response greater than 4.0 on the Likert scale. The seven items constructed to measure the "Demographics" domain had a mean response between 2.92 and 4.50 (Table 1).

We computed the Teacher's Characteristics Index (TI) by summing the scores from the 24 items. In one case ("the teacher refers to the patient by his/her illness") the item was negatively phrased, and the score was thus reversed. The TI ranged from 83-113 (highest possible 120 and lowest possible 24) with an average score of 100 ± 5.99. All items constructed to measure the "Demographics" domain had small or trivial correlations with the TI except for the questions relating to male gender and seniority both of which had a moderate positive correlation. In the "Communication" domain, respecting the confidentiality of the patient and providing instruction about how to write good patient notes were strongly correlated with the TI, while eleven other items showed moderate correlation, and four items had weak correlation with the overall TI. Table 1 shows the corrected item-scale correlations of all items.

We used Principal Component Analysis with Varimax as a rotation method for factor analysis using 16 of the 24 items. Eight items were excluded because they had trivial correlation to the TI, and/or there were mixed responses possibly due to the ambiguity of the item. A variance of 51% could be explained by 3 factors. All items related to the domain of Communications except for the question concerning whether the teacher was a good listener, loaded unequivocally onto factor one, which explained 27% of the total variance. The academic rank, clinical status and being a good listener loaded onto factor 2, while the gender, nationality and language abilities loaded onto factor 3. The last 2 factors each explained 12% of the variance (Table 2). Items loaded onto factors 1, 2 and 3 had a Cronbach's α of 0.85, 0.66 and 0.49 respectively.

Discussion:

This study was designed to collect information about the most important characteristics of the ideal bedside teacher. That is, the expectations rather than the relationship between expectations and experience were examined.

The results support the hypothesis of the existence of a distinct and important domain of "Communication". It is important to note that all these characteristics can be changed rapidly if the teacher so desires; they are behaviours rather than enduring characteristics. The second domain of "Demographics" plays a much smaller role in characterizing an ideal bedside teacher as shown by the correlations with the teacher index. Two factors were identified for these items, the first of which includes properties such as academic rank and clinical status. While these may change over time, they cannot immediately be altered by such things as teacher training. The second factor in this domain includes items which are difficult or impossible to change, such as gender, nationality and spoken language. The item concerned with listening skills did not load onto the "Communication" domain as expected, though listening is a clearly a communication behaviour. It clustered with properties related to seniority and academic rank; this may arise because listening attentively is a skill that takes some time to master.

The students consider the nationality, the spoken language and the teacher's academic rank to be unimportant determinants of ideal bedside teachers while they consider male gender and being a senior doctor to be somewhat important. Research on student ratings of their teachers suggests that gender issues may play a role, although these findings tend to be complex, inconsistent, and small in size (Marsh and Roche, 1997). In community-based ambulatory care, Carney et al (2000) found that gender-discordant pairs of preceptors and students appeared to have a more ideal academic relationship. Our study found that both male and female students prefer a male teacher for BST, echoing on similar finding from medical students and graduates in the United Arab Emirates, who identified a larger number of males than females as role models (Elzubeir and Rizk, 2001). Whether this arises because of the small number of female faculty, different learning preferences or whether it is a deeper culturally-determined issue, would be an interesting topic for future research.

While the effects of the age of the teacher and years of teaching experience on student evaluation is controversial (Marsh and Roche, 1997), these issues are generally see as unimportant (Cashin, 1995). The issue of resident teaching in comparison to senior faculty has been looked at extensively (Wamsley *et al*, 2004). Bing-You and Sproule

(1992) found that students estimated that one-third of their knowledge could be attributed to teaching by residents. Callcut and others (2004) found that junior surgeons were more effective teachers than their senior counterparts. In contrast, Stern and co-workers (2000) concluded that the clinical teaching ability of the attending faculty (analogous to "senior doctors" in our study) had a positive and significant effect on medical student learning where the teaching by residents had no significant effect. In our study, the students preferred the instruction to be by a senior doctor consistent with this last observation, but the issue is almost certainly more complex than this. Factors such as examinations, availability of doctors to deal with student matters, educational training and the reward system for ideal teaching are likely to play some roles in the perceptions of the students. These questions remain unanswered, but they are of crucial importance to medical education in the Arab world because, in contrast to North America, the majority of the clinical workforce and clinical teachers are junior doctors.

Using simple and clear language for communication was seen by students as much more important than speaking Arabic or even being from the same country. This is a reassuring finding and helps with the management of education in teaching communities that are heavily populated by expatriates who do not speak the language of the patients. Despite some reports from Arabic medical schools that suggest that student achievement and participation is hindered by their limited proficiency in the English language (Mpofu et al, 1998), there is growing evidence (Ypinazar and Margolis, 2004; Yazigi et al, 2006) to support our findings, perhaps because the western medical model has become so widely adopted.

Academic affiliation was found not be a necessary characteristic of an ideal BST teacher. Although, there is evidence that training clinicians in instructional techniques correlates positively with student satisfaction and achievements (Pandachuk et al, 2004), there is no reason to believe that such training occurs only in academic faculty. Indeed the majority of students are indifferent as to whether their teacher has an academic title.

A number of items, including the use of humor in teaching and emphasis on upcoming examinations, correlated poorly with the TI, despite the fact that the majority of students regarded these as being part of the behaviour of a good bedside teaching teacher. This apparent inconsistency probably arises because these behaviours are desirable but insufficient by themselves to delineate a good teaching experience. For example it is entirely possible for a poor teacher to use humor without that behaviour helping the students to learn.

The students identified an ideal teacher as someone who gives constructive feedback, who is approachable, who encourages critical thinking, who guides the students to additional learning resources, in agreement with many other studies of general clinical teaching (Irby *et al*, 1991; Wright *et al*, 1998; Parsell & Bligh, 2001; Torre *et al*, 2003). Writing good patient notes and records, which is usually a neglected skill, is considered important by our students.

This study highlights the importance of providing students with an opportunity to observe the doctor using simple and clear language with the patient, remembering his/her name, respecting confidentiality, treating the patient with dignity and considering the psychosocial aspects of the patients condition. Students found these issues to be the most desirable in deciding who is an ideal teacher; all showed moderate to strong correlations with the TI. This echoes the findings of studies related to learner perceptions of role models and the means by which they learn professional behaviour (Wright *et al*, 1998). It is commonly supposed that students are preoccupied with the medical conditions of patients rather than the consequences of those conditions – that they concentrate on the disease rather than the illness. At least in this group of students, the psychosocial aspects emerged as a key learning point well recognized by the students.

The characteristics identified as important in an ideal BST experience are similar to those found in studies of general clinical education, which suggests that many of the more general findings can be transferred to the specific situation of clinical BST. All of these characteristics are changeable and measurable, and can thus be assessed for individual teachers and used as the basis for faculty development and evaluation of performance. Students consider that nationality and language abilities of teachers are relatively unimportant, which is a useful indication that culturally-determined issues may not be as crucial as previously thought.

The findings of this study confirm the importance of the communication and behaviour domain and identify 9 items for possible use in a design of an evaluation instrument for

BST in the future. It sheds light on the need to explore further issues related to gender and seniority of a teacher and their effect on BST and clinical education in general.

This study was limited by sample size, and involved students in one medical school only. It remains to be seen whether these results can be extrapolated to other situations. Nevertheless, our observations, which suggest that students are perceptive participants in the BST experience, were obtained from a student body that might be expected to hold more traditional views. One would expect *a priori* that the results would be similar in other learning environments.

Table 3-1: Item Means and Correlations

Items	Mean ± SD	Correlations[1]
I would like the teacher in the bedside teaching session to :		
1. use simple and clear language	**4.85 ± 0.36**	**0.34**
2. be a good communicator with the patient	**4.84 ± 0.37**	**0.49**
3. be approachable	**4.81 ± 0.40**	**0.33**
4. guide me to areas of further learning in relation to the patient's	**4.77 ± 0.42**	**0.33**
5. guide me to the sources of information I will need	**4.69± 0.47**	**0.41**
6. give me a constructive feedback on my performance	**4.80± 0.44**	**0.39**
7. respect the confidentiality of the patient	**4.79 ± 0.45**	**0.54**
8. encourage me to think critically	**4.77 ± 0.46**	**0.49**
9. teach me how to write good patient notes	**4.74 ± 0.51**	**0.54**
10. consider the psych-social aspect of the patient's illness	**4.68 ± 0.59**	**0.35**
11. be a good listener	**4.66 ± 0.68**	**0.43**
12. be a senior doctor	**4.50 ± 0.84**	**0.35**
13. remind me of exams/tests to come	**4.24 ± 0.82**	**0.15**
14. use humor during teaching	**4.15 ± 0.89**	**0.20**
15. remember the patient's name	**4.26 ± 0.77**	**0.30**
16. remember my name	**4.02 ± 0.71**	**0.33**
17. have an academic rank	**4.02 ± 0.98**	**0.20**
18. refer to the patient by his/her illness ***(reversed)***	**3.84 ± 1.24**	**0.13**
19. to speak Arabic	**3.00 ± 0.83**	**0.26**
20. give a lot of theoretical information for me to write down	**2.79± 1.19**	**0.13**
21. be a junior doctor	**2.92 ± 1.10**	**0.01**
22. be a male	**3.41 ± 0.74**	**0.38**
23. be an Omani national	**3.39 ± 0.66**	**0.22**
24. be a female	**3.15 ± 0.54**	**0.21**

[1]: Corrected item-scale correlations.

Table 3-2: Items Factor Analysis

Items :	**Components**		
I would like the teacher in the bedside teaching session to:	**1**	**2**	**3**
respect the confidentiality of the patient	**0.87**	0.08	0.02
guide me to areas of further learning in relation to the patient's problem(s)	**0.83**	-0.01	0.06
encourage me to think critically	**0.72**	0.13	0.17
give me a constructive feedback on my performance	**0.70**	-0.05	0.02
be a good communicator with the patient	**0.68**	0.15	0.00
be approachable	**0.60**	0.17	-0.42
consider the psych-social aspect of the patient's problem	**0.59**	-0.01	-0.18
teach me how to write good patient notes	**0.58**	0.00	0.25
guide me to the sources of information I will need	**0.47**	0.17	-0.22
be a senior doctor	-0.01	**0.82**	0.13
have an academic rank	-0.01	**0.74**	0.02
be a good listener	0.30	**0.71**	-0.07
be a female	0.01	0.17	**0.68**
be a male	0.22	0.31	**0.60**
be an Omani national	-0.06	-0.04	**0.60**
speak Arabic	-0.02	-0.11	**0.55**
Total variance explained by each factor :	**27%**	**12%**	**12%**

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Chapter IV

Domains of Effective Bedside Teaching: Students' Perspectives in Two Medical Schools[2]

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[2] A version of this paper has been accepted for publication. AlWeshahi, Y. and Cook, D.A. Domains of Effective Bedside Teaching: Students' Perspectives in Two Medical Schools. Medical Teacher

Introduction:

Teaching in the presence of the patient is perhaps the most significant method used to learn clinical medicine. This method which is usually referred to as “bedside teaching” is a fluid entity by itself, occurring as a learning experience whenever students, teachers and patients interact (Gale and Gale, 2006) and so can take many forms (Hartley *et al*, 2003; Beckman, 2004). The definition that suites our research is the one used by Nair and others (1997) which basically states that bedside teaching (BST) occurs ‘when a clinician takes a group of learners to the bedside of a patient, listens to the history, elicits physical signs, makes a provisional diagnosis and decides on the best diagnostic and therapeutic options’. This rich and complex experience has been the focus of many articles based on personal experience or opinion of experienced clinicians and educators (Kroenke and Omori, 1997), and some experimental studies have attempted to define it in more objective terms (Ramani, 2003). Such studies have looked at a variety of components such as feedback or instruction in clinical procedures, and furthermore, attempts have been made to provide models that describe the cognitive processes and structuring that lead to learning and development of expertise (Ramani *et al*, 2003; Janicick and Fletcher, 2003; Cox, 1993). There have been rather few studies, however, that have explored the specific process of bedside teaching from the perspective of the learner. Nair *et al*. (1997) reported that students uniformly felt that bedside teaching was the best way to learni clinical medicine, and about half of his stent sample felt that there was insufficient exposure to this approach. Much more recently Williams *et al*. (2008) used a qualitative approach and reached similar conclusions, but were able also to identify some distinct barrier to wider implementation of bedside teaching and to suggest some strategies for overcoming these problems. We have previously described the characteristics of students' perceptions of the ideal bedside teacher, based on information from one medical school (AlWeshahi *et al*, 2007). In this paper we discuss the characteristics of the ideal bedside teaching process, using data from two different medical schools. A clear definition of the student perceptions of what bedside teaching process should entail may lead to a more effective utilization of this process as a powerful tool for learning clinical medicine.

Other research in the area of clinical teaching and teaching in general has enabled us to identify many of the issues that might be germane to the process of effective bedside teaching. Some of the more important issues in this regard are shown in Table 1. This list is not exhaustive, but it covers the major points identified in the literature of medical education, and *mutatis mutandis* is consistent with the education literature in general.

There are several potential sources of information about the process of bedside teaching, but

the opinion of medical students has proved to be useful and representative; this was the source of information for our previous conclusions about the characteristics of the ideal bedside teacher. In the present work, where we have looked at the process of bedside teaching rather than the behaviour of the instructor, we were interested in extending our sample to include a North American medical school. We thus report here information from students from two different countries.

Methods:

Context of study: The study was conducted at the College of Medicine and Health Sciences of Sultan Qaboos University, Oman, and at the Faculty of Medicine and Dentistry of University of Alberta, Canada. The former has a three year clinical curriculum as part of a seven year program. Students are recruited directly from high school; the pre-clinical curriculum uses a variety of different teaching strategies and the clinical teaching involves clerkships that are similar to those used in many other countries. The University of Alberta has a two-year preclinical curriculum, which uses both lectures and problem-based learning, followed by a series of clerkships that take two more years. In other words it is a typical North American program, which is mostly graduate entry. In both schools, clinical teaching takes place in in-patient, ambulatory and rural sites. The principal teaching method in Oman is bedside teaching which is conducted in a protected time, usually for an hour, with a group of students led by a clinician. The clinical service for the patient is conducted at other times, so here the bedside process is entirely focused on teaching and learning. At the University of Alberta, bedside teaching is usually conducted in the context of providing clinical service to the patient.

Instrument: A 47-item questionnaire was developed based on the issues identified by the literature review. Each item was designed to measure one or more of those identified issues. A theoretical organizational model for bedside teaching suggested by Cox (1993) was used to organize the items in the instrument. The items were constructed specifically for this questionnaire, since no appropriate instrument was already available. The only demographic variable collected was the gender of the individual completing the questionnaire. With the exception of Item 27 which was concerned with the duration of the session and Item 46 which asked the student to reflect on the appropriateness of the questionnaire to elicit information about bedside teaching, the remaining 44 items were all concerned with student perceptions of different domains of the process of bedside teaching itself. Students were asked to respond using a five-point Likert scale (5=strongly agree, 4=agree, 3=neither agree nor disagree, 2=disagree, 1=strongly disagree). In order to provide validation for the instrument, the questionnaire was reviewed independently by three established international experts of whom two suggested minor modifications, and the questionnaire was piloted on a group of 10 students who were encouraged to make open-ended comments on the questions. No substantive suggestions were made by the students and thus no further modifications were made to the questionnaire.

The students received letters from the researchers explaining all aspects of the study, that they would be permitted to see the results, and explicitly guaranteeing personal anonymity. The project was approved by the Ethics Committee at the College of Medicine and Health Sciences of Sultan Qaboos University and the Health Research Ethics Board of the University of Alberta.

Subjects: In Oman, one hundred and seventy four final year medical students in the academic years 2003/2004 and 2004/2005 received the questionnaire. The questionnaires were delivered by the student representative of the respective academic year who volunteered to distribute and collect the completed questionnaires. In Canada, eighty seven final year medical students in the academic year 2006/2007 received the questionnaire which was distributed and collected by the researchers.

Statistical analysis: We used the subjects-to-variables ratio (SVT) rule suggested by Bryant and Yarnold (1995) to decide on the adequacy of the number of cases for principal component analysis. Barlett's sphericity test was used to determine whether there was a correlation between items. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was also employed. These two tests were used to determine whether factor analysis was an appropriate tool.

A "little Jiffy" (Kaiser, 1970) factor analysis was performed to identify any significant factors, which were selected on the basis of Kaiser-Guttman criteria and Cattell's scree plot. The scores assigned to the items on the five-point Likert scale were also recorded and the mean value and standard error was determined.

Results:

One hundred and seventy four students in Oman and eighty seven students in Canada were contacted; the response rate was 75% and 97% respectively making the total number of respondents 214 students from both schools of whom 48.5% were male and 51.5% were female. Cronbach's α was 0.89 for all items.

Barlett's sphericity test was highly significant (0.00), which indicates that there is a correlation between items. The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was 0.805 which suggests that the degree of common variance among the variables is meritorious. The results of these 2 tests justified the use of factor analysis.

The number of factors that were accepted was based on 3 criteria; Cattell's scree plot, an eigenvalue of more than 1 and whether items could be attributed to a theoretical cluster. Twenty one of the 44 items were excluded either because they were not discriminating or they were ambiguous. Accordingly, the subjects-to-variables ratio (SVT) was 5.42. We used principal Component Analysis with Varimax as a rotation method on 24 items and that revealed 6 factors, which correspond to Preparation, Introduction, Experience, Summary, Explanation, and Conclusion. Those 6 factors explained 60% of the total variance. Cronbach's α for each of the six factors was 0.58, 0.66, 0.65, 0.73, 0.75 and 0.78 respectively (Table 2). In addition the mean score provided by the students and standard error for each item are shown in the right-hand column of table 2.

Discussion:

According to situated learning theory, the development of clinical expertise depends more on specific experiences in a realistic setting, and less on generic problem-solving skills and general knowledge (Perkins and Salomon, 1989). Therefore, it is important to maximize the learning from those realistic experiences such as bedside teaching. In bedside teaching, the primary participants are a teacher, the students and a patient, and the interaction of these three will play the major role in determining the success of the process. The characteristics of the teacher have been described in other communications, but the behaviour of the teacher and the way they conduct the learning that happens at the bedside may be different from their characteristics. For example, characteristics such as empathy for student and patient, approachability and so on are important, but do not tell us how the bedside teaching should actually be conducted. The principal component analysis suggested that the data could be assigned to six domains, and these are immediately recognizable as discrete components of the bedside teaching process.

The first (*Preparation*) includes factors that are concerned with the preliminary setting for the teaching and involves both preparing the patient for the encounter and taking the trouble to determine the initial levels of knowledge of the students. The second domain (*Introduction*) is concerned with introduction of the patient to students and vice-versa and communication in very simple language around the patient's bed. The third domain (*Experience*) is concerned with the clinical experience at the bedside which may involve, but is not limited to, presentation of the case by a student, taking a history and eliciting physical signs. It involves the teacher's observation of the learning of his/her students. The fourth domain (*Summary*) is concerned with the process by which there is an opportunity to summarize the learning which has just occurred. The fifth domain (*Explanation*) is concerned with an explanation and elaboration of what happened during the patient encounter. The last domain (*Conclusion*) identifies feedback and a future working knowledge as a last step in the bedside teaching process. Some of these domains were explicitly recognized by other researchers or alluded to in some models of clinical teaching (Janicick and Fletcher, 2003; Cox 1993). Each of these is discussed in more detail below.

The domain we have called "preparation" involves the instructor understanding the prior knowledge and skills of the student and understanding the status of the patient. Many admit that one of the chronic problems of clinical education is teaching at inappropriate level, so that, for example, a third year undergraduate student becomes exposed to instruction at the level of a sub-specialty resident. This is a particular problem when there is a heterogeneous group of learners at the bedside, and the students clearly felt that the teacher must understand in advance the audience for whom the learning has been arranged. This is a reflection of ample research by constructivists in terms of building new knowledge on prior knowledge by developing a better understanding of the learner (Vaughn and Baker, 2001).

The issue of patient consent for teaching is polemic, with some authors favoring a mandatory written consent (Hartley *et al*, 2003) and others a less formal verbal consent, which must still be accompanied by a full explanation of the purpose and the procedures (Howe and Anderson, 2003). Clearly the preparation phase must also involve ensuring that the patient is ready for the subsequent interaction with the learners, and this carries with it the idea that the physician conducting the bedside teaching should be in contact with the patient and familiar with their illness. This will occur when the instructor is part of the management team, as shown by the response to this question.

The domain we have described as "introduction" involves the need for easy communication between learner and patient and this entails both politeness and communication in terms that the patient can understand. The third domain of characteristics, "experience", stresses the need for active involvement of the student. Bedside teaching needs to involve the student taking the history, conducting the physical examination and being coached while these are happening. Many reports have described the decline in direct observation of student behaviour during their clinical education, despite the fact that this is a critical part of their learning. Students and junior doctors often report that observation by instructors during the process of obtaining a history or conducting a physical examination was rare or absent. This can lead to the trainees being unaware of their own deficiencies (Erricson, 2004). The students in our study emphasized the importance of direct supervision, in agreement with the findings of Howley and Wilson (2004).

Teaching at the bedside can produce an overwhelming amount of information, and students are not always able to discern for themselves what matters are important and what is of less relevance and interest. While giving a summary of the learning immediately after it happens is widely accepted part of the conclusion of a lecture, this is less well established in other instructional formats. Helping the students to identify the important things that they have learned is an important part of the process.

The "explanation" domain involves dealing with any questions that the students may have and then encouraging the students to think critically about what happened, with a view to developing a clinical reasoning schema. Critical thinking as a potent stimulator of learning has been studied extensively and recommended elsewhere in many higher education fields (Maudsley and Strivens, 2000). The process takes the student into the details of different aspects of the patient problem that might include everything from pathophysiology to aspects of ethics, collaborative practice or social support, as well key issues that surround investigation and management.

In the conclusion, students require feedback as an integral part of the process. The preferred form of feedback seems to be of the "on-action" rather than "in-action" type (Branch and Paranjape, 2002) in that the students sought feedback after the interactive learning with the patient had occurred (Chambers and Wall, 2000). Furthermore, this last domain deals with creating "cognitive prostheses" (defined as affordances for overcoming cognitive load limitations) either in terms of practical take-home messages , flowcharts, specific short notes or even mental notes. This helps the students to remember and connect current information to previous learning. This part of the process looks toward the development of knowledge and skills that can be applied in future situations.

That the students appreciated receiving a specific summary of the learning might suggest that they have fewer characteristics of "adult learners", who are suppose to be independent, experienced, internally motivated , and problem oriented. This "dependence" is obvious in many of the responses which suggest that to a considerable extent the medical students want the teacher to guide and help. However, in agreement with other findings it is equally likely that that the process of learning is similar in all groups, but that the configuration of learner, context, and process has qualitative and quantitative components that may be different in learners at different stages of development (Merriam and Caffarella, 1999). The students need for assistance with a summary is probably not a demonstration of their inability to function as "adult learners", but rather is a reflection of the learning vector theory of the dependence of graduating medical students on their teachers (Paukert and Richards, 2000). That the process is student centred in the affective domain rather than teacher directed is clear from the students interest in formulating the summary themselves and receiving guidance during the process.

The identifications of these domains provides a guide based on evidence from the students, who are rarely asked about their expectations, as to the process of an ideal bedside teaching experience, but the list of domains identified is certainly not exhaustive and mostly represents in-hospital bedside teaching; other environments may modify the suggested domains. For example, in a walk-in clinic, the "preparation" phase may not be feasible, or in the operating room "introduction" which is based on a conscious patient may also be unrealistic. How these domains produce learning, whether they work collectively, separately or sequentially, the conceptualization of each domain with possible sub-domains, and their operationalization remains to be investigated. Because the process of bedside teaching is a dynamic one, the way in which the teacher and students elect to implement these domains will vary depending on the learning environment.

It seems reasonable that attention to these domains will result in an improved learning experience at the bedside, in the same way that attention to process in lectures or in other instructional modalities such as problem-based learning results in an improved learning experience. Additional refinement of the instrument, examination of a broader sample of students and further information about the learning environment in which bedside teaching occurs will enable us to devise a more precise guide to the characteristics of an effective bedside teaching process. The opinions of the students may assist in the development of model of bedside teaching that is experimentally-based, but it is premature to suppose that the outline suggested here represents an established model of the bedside teaching process.

Table 4-1: Important Factors in Effective Clinical Teaching

Interaction/communication

- Attention to the comfort, privacy and dignity of the patient including consenting (Howe and Anderson, 2003)
- Proper introduction of learners/patient (Schwenk and Whitman 1987)
- Clear communication (Van de Wiel and Boshuizen, 1999)

Appropriate pedagogy

- A student-centred approach (Wolpaw *et al*, 2003)
- Creation of an environment conducive to learning (Hutchinson, 2003)
- Articulation of clear learning objectives (Miffin and Price, 1997)
- Appropriate organization of the learning experience (Harris, 1998)
- The linking of new learning to old knowledge (Schmidt *et al* , 1990)
- Encouragement of critical thinking (Maudsley and Strivens, 2000)
- Active engagement of the students
- Knowing the learner (Vaughn and Baker, 2001)

Table 4-1 (continued): Important Factors in Effective Clinical Teaching

Specific objectives

- Instruction in history-taking
- Instruction in procedures for physical examination
- Discussion of management plans
- Evidence-based approach (Gruppen *et al* , 2005)
- Holistic approach (Mauksch, 2005)
- Compare and contrast cases (Klayman and Brown, 1993)

Coaching

- Appropriate discussion
- Immediate, constructive and concise feedback (Kilminster and Jolly, 2000)
- Illustration of appropriate professional behaviour and social modeling (Wreight *et al*, 1998)
- Direct observation of learner's skills (Holmboe, 2004)

Conclusion

- Opportunity for reflection (Branch, 2002)
- Appropriate summary of the learning (Cox, 1993)
- Discussion of the practical utility of what has been learned (Torre *et al*, 2003)

Table 4-2: Items Responses and Factor Analysis

Items	**Components**						
	Mean±SE	**1-Preparation**	**2-Introduction**	**3-Experience**	**4-Summary**	**5-Explaination**	**6-Conclusion**
I would like my teacher to know my background and abilities in	*3.97±0.06*	**0.70**	0.02	0.09	0.17	-0.14	0.01
I would like the teacher to inform the patient about the BST session	*4.35±0.05*	**0.551**	0.31	-0.19	0.11	0.33	0.15
I would like the teacher to ask the patient's agreement to the physical	*4.33±0.05*	**0.50**	0.48	-0.16	0.02	0.14	0.27
The teacher should be part of the patient's management team	*4.01±0.06*	**0.50**	-0.10	0.25	0.13	0.09	0.36
I would like the teacher to introduce me to the patient by my	*4.13±0.05*	0.08	**0.78**	0.02	0.09	0.14	0.10
I would like the teacher to introduce the patient to me	*4.16±0.05*	-0.04	**0.83**	0.12	0.15	-0.04	0.08
I prefer to communicate in simple language to any questions asked	*4.31±0.04*	0.30	**0.45**	0.32	0.11	0.34	-0.23
I would like the teacher to allow me to present the case	*4.16±0.05*	0.05	-0.06	**0.60**	0.17	0.28	0.30
I would like the teacher to guide me as I elicit the physical signs	*4.30±0.05*	-0.16	0.02	**0.61**	0.26	0.33	0.06
I would like the teacher to allow me to think aloud and describe	*4.22±0.05*	0.00	0.13	**0.57**	0.32	0.00	0.32
I would like the teacher to observe me taking history from the patient	*3.64±0.08*	0.10	0.06	**0.70**	-0.05	-0.04	0.01
I would like the teacher to point out explicitly what we learnt from	*4.37±0.04*	0.06	0.13	0.08	**0.61**	0.04	0.32
I would like the teacher to summarize the history and	*4.37±0.05*	0.17	0.13	0.13	**0.80**	0.13	0.05
I would like the teacher to help me summarize what I have learned	*4.40±0.04*	0.15	0.07	0.13	**0.75**	0.20	0.23

Table 4-2 (continued): Items Responses and Factor Analysis

Items		**Components**					
	Mean±*SE*	**1-Preparation**	**2-Introduction**	**3-Experience**	**4-Summary**	**5-Explaination**	**6-Conclusion**
I would like the teacher to correct any misconceptions or doubts I have	***4.43±0.05***	0.25	-0.06	0.36	0.13	**0.65**	0.21
I would like the teacher to encourage me to think critically	***4.36±0.05***	0.25	0.11	0.24	-0.00	**0.60**	0.33
I would like the teacher to explain the pathophysiological basis of the	***4.27±0.05***	-0.15	0.14	0.05	0.23	**0.72**	0.17
I would like the teacher to discuss how to investigate and manage such	***4.53±0.04***	-0.01	0.06	-0.02	0.28	**0.79**	013
I would like the teacher to give me immediate feedback about my	***4.28±0.05***	0.19	0.18	0.33	0.23	0.04	**0.58**
I would like the teacher to tell me about his/her experience(s) with	***4.28±0.05***	0.11	0.26	0.35	0.03	0.19	**0.55**
I would like the teacher to help me to identify the key learning	***4.39±0.04***	0.08	0.12	0.07	0.23	0.16	**0.77**
I would like the teacher to conclude with guidelines for encounters with	***4.33±0.04***	0.15	0.09	-0.06	0.08	0.27	**0.73**
I would like the teacher to help me to devise a flowchart, working plan	***4.16±0.06***	-0.05	-0.24	0.19	0.29	0.15	**0.83**
Total variance explained by each factor: (%)		**7.4**	**9.2**	**9.9**	**9.5**	**11.2**	**12.8**

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Chapter V

What students want: preferred settings of bedside teaching in two medical schools[3]

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[3] A version of this paper has been submitted for publication. AlWeshahi, Y. and Cook, D.A. What students want: preferred settings of bedside teaching in two medical schools. BMC Medical Education

Introduction:

In previous publications[1-2] we, like many others[3], argued the case for putting more structure into the student experience of clinical education in order to give more value and utility to the educational moments that shape their future practice as physicians. An important component of the education of medical students involves "bedside teaching" or "teaching in the presence of a patient", defined as the teaching that happens when a 'clinician takes a group of learners to the bedside of a patient, listens to the history, elicits physical signs, makes a provisional diagnosis and decides on the best diagnostic and therapeutic options[4]. Thus, we chose to study this area using the views of medical students to obtain information about the ideal teaching-learning experience from their perspective[1-2]. Our conclusions were based on questionnaires submitted to undergraduate students in Oman and Canada, and we were able to identify some specific characteristics of the ideal clinical bedside teacher and the ideal bedside teaching process.

According to adult learning theories, teaching is as much about setting the context or climate for learning as it is about imparting knowledge or sharing expertise[5]. Therefore, in addition to an effective instructor and an appropriate process, an environment conducive to learning becomes a necessity. It is important to note that bedside teaching is a situated learning activity embedded in the context of the social and physical environment of clinical practice. That environment is the result of the complex social interactions between teachers, students, patients, and health professionals which occurs in a specific physical situation. There is voluminous literature and a number of instruments designed to measure the quality of a learning environment at different levels, sites and even in different countries[6], but specific information about the optimal circumstances in which bedside teaching might occur is rather scarce. The setting for bedside teaching is crucial for learning to happen; it is obvious that constraints of space around the bedside, visibility, timing and associated circumstances may have a profound effect on the success of the experience, and we were thus interested in discovering the perspective of the learners about these issues. Those discussions centre on *where* (best location for bedside teaching), *how* (number of sessions per week, duration of each session, appropriate appearance), *when* (best time of the day for the teaching to occur), and *who* (number of different instructors, number of students in the group, presence of nursing staff or family). The inferences that can be drawn from the answers are of significant importance in the planning and implementation of effective bedside teaching.

Earlier data[1-2] suggested that despite the many differences between the programme and the culture in the two countries examined (Oman and Canada), the students viewed the characteristics of the instructor and the bedside teaching process from essentially the same perspective. This study was designed to explore whether the setting for bedside teaching would entail some divergent views amongst the students in the two different countries.

Methods:

Context of study: The study was conducted at the College of Medicine and Health Sciences of Sultan Qaboos University, Oman, and at the Faculty of Medicine and

Dentistry of University of Alberta, Canada. The former has a three year clinical curriculum as part of a seven year programme. Students are recruited directly from high school; the pre-clinical curriculum uses a variety of different teaching strategies and the clinical teaching involves clerkships that are similar to those used in many other countries. The University of Alberta has a two-year preclinical curriculum, which uses both lectures and problem-based learning, followed by a series of clerkships that take two more years. In other words, it is a typical North American programme, which is mostly graduate entry. In both schools, clinical teaching takes place in in-patient, ambulatory and rural sites, although the extent to which each location is used differs. The principal teaching method in Oman is bedside teaching which is conducted in a protected time, usually for an hour, with a group of students led by a clinician. The clinical service for the patient is conducted at other times, so here the entire duration of the bedside teaching is focused on teaching matters. At the University of Alberta, bedside teaching is usually conducted in the context of providing clinical service to the patient.

Instrument: A 10-item questionnaire (as a section of a more extensive general questionnaire about bedside teaching) was developed based consideration of the circumstances in which bedside teaching might be conducted. Item 1, "I prefer the duration of the bedside teaching to be…", allowed the students to give a range or an exact number in minutes (Table 1). Items 2 and 3 are nominal , items 4 and 5 are ordered-category items; all four items required the students to select from a list of discrete choices (Table 1), while items 6-10 (Table 2) are Likert-items with a 5-point Likert response system "5-strongly agree" to "1-strongly disagree".. In order to provide validation for the instrument, the questionnaire was reviewed independently by three established international experts of whom two suggested minor modifications, and the questionnaire was piloted on a group of 10 students who were permitted to make open-ended comments on the questions.

The students received letters from the authors explaining all aspects of the study, that they would be permitted to see the results, and explicitly guaranteeing personal anonymity. The project was approved by the Ethics Committee at the College of Medicine and Health Sciences of Sultan Qaboos University and the Health Research Ethics Board of the University of Alberta.

Subjects: In Oman, one hundred and seventy four final year medical students in the academic years 2003/2004 and 2004/2005 received the questionnaire. The questionnaires were delivered by the student representative of the respective academic year who volunteered to distribute and collect the completed questionnaires. In Canada, eighty seven final year medical students in the academic year 2006/2007 received the questionnaire which was distributed and collected by the researchers.

Statistical analysis: We used SPSS software to calculate frequencies of responses to each item, and to perform appropriate statistical tests. Items were compared using the Kolmogorov-Smirnov test, although appropriate use of the independent sample t-test for ordinal data and the χ^2 test, or the Mann-Whitney U-test for nominal data, provided similar results. A probability of less than 0.05 was considered significant.

Results:

One hundred and seventy four students in Oman and eighty seven students in Canada were contacted; the response rate was 75% and 97% respectively making the total number of respondents 214 students (130 from Oman and 87 from Canada) of whom 48.5% were male and 51.5% were female. The results from the questionnaires are shown in tables 1 and 2.

Discussion:

The local environment clearly has some influence over the optimum circumstances for bedside teaching. This was most clearly demonstrated in the choice of the students about the ideal time for bedside teaching; 66.9% of Omani students thought that morning is the best time. In the Islamic/Arabic culture of Oman a significant reduction of all work and activities is experienced in the afternoon; even government offices close during that time, and this was reflected in the choice of morning as the best time for bedside teaching in that country. Even if the students preferred the afternoons, they will face the problem of patients wishing to sleep. In Canada, where the structure of the working day is different, the students had no particular preference (75% chose "either morning or afternoon") for the time at which the teaching occurred. There has been research that has demonstrated the benefits of an afternoon slowdown or nap/siesta on general health and wellbeing[7] but in the learning field, it seems that the only relevant evidence is the extensive work on the development of expertise through deliberate practice, where the best exercises are done towards the end of the morning[8-9]. We found in a previous study[2] that to make a bedside teaching experience more effective, some elements such as supervision, detailed feedback and well defined tasks to improve specific aspects of performance, are shared with the process of deliberate practice, although this may not explain the Omani students preference for bedside teaching to occur in the morning. Overall, the choice of time probably depends more on personal and cultural factors than optimization of learning.

In many instances, the choice of students is based on their experience; although this is not an evaluative study, and we were careful to ask the students about their concept of the ideal experience rather than the best experience they had previously enjoyed, there is little doubt that their perceptions are based on their own educational experience. This was clear in the choice of the inpatient setting by 97.7% of students in Oman. Students in Oman preferred an in-patient setting probably because that has constituted the bulk of their experience. The students in Oman seldom have opportunities to experience bedside teaching in an ambulatory care setting. In Canada, however, where the students experience bedside teaching in a variety of different situations, there was no particular preference for one location over another (78.6 % of students chose "either inpatient or outpatient"). This arises more from the nature of health care in the two countries than from educational policy; in Oman, even relatively uncomplicated cases are admitted to an inpatient service for lengthy stays, while in Canada, patients are mostly managed on outpatient basis and discharged from hospital at the first opportunity. Although there is strong evidence that learning in an ambulatory setting is preferable because of the patient mix and availability, most of that evidence come from the Western world. It is unwise to generalize when the in-patient populations are very different, and this emphasizes again that information gained about effective instruction in one country, may not readily be transferable to another geographical site.

The same issue of context and past experience could explain why 81.9% of students in Canada wanted only 1-3 students per group as compared to 48.8% of their Omani counterparts. Of the Omani students 42.6% felt that an ideal number was 4-6 as compared to less than 20% of Canadian students. While bedside teaching in Canada happens during the service rounds with 1-3 students typically attached to a practicing team that may include residents and others, in Oman larger number of students get together for specific instruction during the bedside teaching experience. It is significant that both groups roundly rejected a group that comprises more than six students, presumably because if the diminished opportunities for personal attention and hands-on experience. There is evidence from the literature about deliberate practice that one-on-one instruction is superior, although there is a much older study that reported the effect of group size on the assessment scores of 4th year clinical students, and found no significant difference between groups of 4 or 8 students[10].

In the past, apprentices learning clinical medicine tended to study with one master. This is essentially impractical in current medical teaching, although assigning a student to one mentor throughout their training is sometimes practiced. In some medical schools, the students learn communication skills, history-taking and physical examination from one individual, but these programs are of shorter duration and more restricted scope than an entire clerkship. There is however, an increasing interest in students experiencing combined clerkships in which they would be exposed to the same instructors over a longer period of time, and it thus seemed relevant to ask the students whether they would like a more stable instructor-student relationship. The group in Oman was almost equally divided (50.4% were against or strongly against having same teacher for the entire clerkship compared to 41.9% who would prefer it). The students in Canada were clearly opposed to the idea. Again, this difference may arise from the students' experience of clinical teaching. In general, students in Oman are exposed to a smaller number of different teachers during the structured part of their learning. We have shown previously that students from both countries prefer the teacher to understand their background knowledge of clinical skills[2], and this may be easier to achieve when there is only one teacher rather than many. Students in Oman spend a great deal of one clinical year doing minor clerkships of 2-4 weeks each, a situation that does not exist in Alberta, and the influence of this aspect of clerkship structure may also play a role.

While the students in both Oman and Canada were reluctant to have the teaching occur in the presence of a relative, this opinion was stronger in Oman, possibly because the presence of relatives is more probable in that environment. Surprisingly, the presence of the in-charge nurse of the patient was not welcomed by the Canadian students but welcomed by the students from Oman. We expected the opposite since there is more emphasis of team work and inter-professional learning in Canada than in Oman. It is possible that the reluctance on the part of the Canadian students to have a nurse present arises from the balance of teaching and service that occurs in the two different systems.

If the sole purpose is student learning, the nurse may provide a welcome additional resource, however if there is a substantial emphasis on patient care, the nurse may be more concerned with clinical service and thus diminish the time spent on teaching. Other explanations are also possible like the more understanding of the busy schedule of the nurse duties or to limit number of people around the patient's bed.

About two thirds (66.2%) of the students in Oman wanted to have as many bedside teaching sessions as possible. While 41% of their counterparts in Canada wanted the same, about the same percentage wanted to have only 3-4 sessions each week. Clearly students from both countries view teaching at the bedside as an excellent use of their time, but there is at least some recognition that there are other important methods of learning clinical medicine. The socio-cultural environment in the clinical teaching sites is not limited to the bedside, and students need to be involved in activities as ward rounds, morning meetings, journal clubs, and radiology discussions to learn both the necessary clinical information and to learn how to work in teams. Students need to move from being a novice who participates in the clinical practice of the health care team only peripherally to a more central role; that is when situated learning from participation in an authentic situation actually occurs[11]. Furthermore, better learning happens when similar learning activities are spaced rather than massed[12] since we all need time to process learning. Despite the enthusiasm of the students for this instructional approach, these constraints, and those of logistics need to be considered.

A further aspect of the timing of bedside teaching concerns the duration of each experience. The students in Canada and Oman wanted each session to last 30 or 60 minutes respectively. Interestingly, there is evidence that the average bedside teaching session lasts no more than 3-6 minutes[13]. This observation has triggered a number of articles that comment on the unfortunate decline in the use of bedside teaching as a principal method of learning clinical medicine[14-15]. The students in Oman wanted the experience to last for an entire hour while those in Canada generally wanted less time. There are at least two possible explanations for this. First, one hour is the normal scheduled length of time for a bedside teaching session at the Sultan Qaboos Medical School. Also, the "cognitive load" has an effect of the choice for the students in Oman since the teaching is done in a different language from their primary mother tongue (Arabic) and communication with most of their patients is also in Arabic[16]. This complication could also play a role in the choice of the Omani students for more bedside teaching sessions.

The students in Canada had no particular preference as to whether they were seated or standing during the bedside teaching session while their counterparts in Oman were marginally more interested in being seated. Providing seating for students is both more realistic and more important in a "protected time" bedside teaching environment where the instruction may take up to an hour, and is more difficult to do in the environment of clinical service as happens in Canada. There is an interesting difference in the preference for the wearing of a white coat by the students. It is a custom in Canada that the white coats of students are shorter than those of practicing clinicians, and so the distinction can easily be made. This not the case in Oman where there is no difference between the length of the white coat worn by individuals with different levels of expertise. It is possible that the wearing of the same coat as the preceptor gives the students in Oman a welcome feeling of belonging to the same professional group, although there are also cultural difference in terms of dress that undoubtedly play a role.

Unlike the parameters which we investigated in the areas of the characteristics of the ideal bedside teacher and the optimal teaching process, there are substantial differences between students in Oman and in Canada in their perceptions of the actual circumstances of the delivery of instruction at the bedside. It has been reported that there are some cultural differences in the pattern of responses to Likert-scale questions, in that some cultures seem to be intrinsically less comfortable with selecting the extremes of the scale[17], however the differences seen probably do not arise from this cause. In our study, there does not seem to be a consistent pattern of students from one country avoiding or selecting the extremes of the scale.

Whatever the reasons, it is clear that in the circumstances in which clinical bedside teaching occurs, extrapolation from one culture to another is unwise. In making decisions about the optimum instructional strategy on the basis of the experiences of others, it is essential that we are clear what findings are universal and what findings are determined by geographical or cultural factors.

Table 5-1: Responses to Items 1-5

Items *(with their response choices)*	**Responses#** Sultan Qaboos University∞ ***University of Alberta****				
I prefer the duration of BST to be: ¥ *(Average in minutes with 95% confidence interval))*	59.88 (54.30,65.47) ***36.12 (31.02,41.22)***				
What is the best time for BST? ¥ *1.Morning 2.Afternoon 3.Either*	66.9% 87 ***17.9% 15***	10.8% 14 ***7.1% 6***	22.3% 29 ***75.0% 63***		
Whereabouts is BST best offered? ¥ *1.An outpatient setting 2.An in-patient setting 3.Either*	2.3% 3 ***1.2% 1***	97.7% 127 ***20.2% 17***	0.0% 0 ***78.6% 66***		
How many bedside teaching sessions should be held each week? ¥ *1.1-2 2.3-4 3.5-6 4.The more the better*	1.5% 2 ***9.6% 8***	23.1% 30 ***41.1% 34***	9.2% 12 ***8.4% 7***	66.2% 86 ***41.0% 34***	
What is the ideal number of students for a BST session? ¥ *1.1-3 2.4-6 3.7-9 4.10-12 5.Any number*	48.8% 63 ***81.9% 68***	42.6% 55 ***16.9% 14***	7.0% 9 ***0.0% 0***	0.0% 0 ***1.2% 1***	1.6% 2 ***0.0% 0***

#: Responses in the same order of response choices for each item.
∞: Responses from Sultan Qaboos University- upper row of each cell.
* : Responses from University of Alberta- lower row
¥: Items with significant statistical difference between the 2 groups.

Table 5-2: Items 6-10 Statistics

Items *(with their choices)*	Strongly agree	Agree	Neither	Disagree	Strongly disagree
I would prefer the same teacher for the BST for the entire clerkship. ¥	*10.1∞*	*31.8*	*7.8*	*24.8*	*25.6*
	2.4 *	**10.7**	**19.0**	**42.9**	**25.0**
The in-charge nurse of the patient should attend the BST. ¥	*11.5*	*42.3*	*20.0*	*21.5*	*4.6*
	2.4	**13.3**	**31.3**	**38.6**	**14.5**
I would like the patient's family member(s) NOT to be present during the BST. ¥	*53.1*	*33.1*	*9.2*	*1.5*	*3.1*
	8.4	**42.2**	**41.0**	**8.4**	**0.0**
I prefer to be seated at the bedside during the teaching.	*11.5*	*39.2*	*11.5*	*24.6*	*13.1*
	7.1	**20.2**	**47.6**	**23.8**	**1.2**
I prefer to wear white coat during BST. ¥	*36.9*	*41.5*	*14.6*	*4.6*	*2.3*
	2.4	**14.3**	**39.3**	**32.1**	**11.9**

∞: Percentage of responses from Sultan Qaboos University students. (upper row)
* : Percentage of responses from University of Alberta students (lower row)
¥ : Item with significant statistical difference between the two groups based on MaWithney-U test, independent samples t-test and χ2-test.

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Chapter VI

Characteristics of effective bedside teachers: comparing the perceptions of students and teachers.[4]

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[4] A version of this paper has been submitted for publication. Alweshai, Y and Cook, D.A. Characteristics of effective bedside teachers: comparing the perceptions of students and teachers. Academic Medicine.

Introduction:

Those educating high school students require special training before certification is issued, and there is a substantial literature about the qualities that make a good teacher[1-2]. The situation in most universities is rather different[3]; any expert in the field or the profession will be expected to teach, and it is assumed that they will be able to teach successfully. The field of clinical education is no exception. Physicians and residents are uniformly expected to teach at some point in time, often with little advice on the behaviors and process that make learning easy for the student, and the situation becomes even more challenging in very complex learning environments such as hospitals. The process of teaching students in the hospital or clinic, and particularly teaching in the presence of a patient, needs to be considered as part of the socio-cultural interactions in that environment. In a situation where much of the teaching is opportunistic[4], both the instructor and the students need to take every advantage of the situation. Although faculty development for those teaching medical students is widespread, a large majority of the programs are devoted to training lecturers or problem-based learning tutors. It is reasonable to suppose that such programs will help instructors who are providing seminars, Grand Rounds, problem based learning or similar teaching activities, but sessions designed to improve clinical bedside teaching are seldom available. "Bedside teaching" simply means teaching in the presence of the patient; this method is a cornerstone of the development of a competent physician, and, in its various forms is a daily educational activity in any clinic or hospital. It differs from most other aspects of medical training in that the teaching-learning experience involves the triad of teacher, student and patient, with the primary goal of learning real clinical medicine.

The paucity of faculty development activities for bedside teaching arises in part because many of the teachers are part-time staff who are already contributing time and energy to undergraduate education, to their own financial disadvantage; institutions are sometimes reluctant to place the additional burden of education workshops on these individuals, although the better instructors are often enthusiastic about learning more about teaching. A more important point is that while we know what constitutes an effective lecturer or problem-based learning tutor, we have much less information about the behavior of the instructor that makes teaching at the bedside effective. Indeed it is uncertain whether the characteristics that create a good bedside teacher can actually be altered by instruction, although there is plenty of evidence in other areas of education that teacher training leads to improved learning on the part of the student.

Some general behaviors of the teachers that might apply *mutatis mutandis* to bedside teaching can be identified in the medical education literature and these are sometimes used as the basis for the evaluation of clinical teaching[6-8]. Most schools evaluate clinical instructors including those individuals whose primary teaching role is at the bedside, although evidence that the numbers generated truly correspond to student learning is much more flimsy than in the case of lectures. Rather than evaluate actual teaching performance, we elected to investigate bedside teaching by asking students and instructors to consider their perspectives and beliefs about what constituted an ideal bedside teaching experience.

Teachers' perceptions or beliefs about teaching model the way in which they teach[9-10]. Gaining insight into the perceptions of the students' about the learning/teaching interchange at the bedside is important for a similar reason; the perceptions of the student about the experience will determine their ability adapt to the learning environment and hence to the success of the learning[11]. Furthermore, the belief of the teaching staff about what constitutes excellence in teaching influences their teaching approaches which in turn affects the learning outcome in the students[12].

The perceptions of students of the characteristics of the ideal teachers are dependent on the circumstances in which the teaching takes place. For example students value factual learning supplied by lecturers more highly than that provided by discussion leaders[13-14]. This makes it important to study bedside teaching as a separate entity rather than as a subset of all other educational activities.

We have thus compared the perceptions of students and teachers about the ideal bedside teaching experience, with a view to identifying commonalities and particularly identifying areas where the views diverged. The opinions of the students are not always given the consideration they deserve, and if their views about the optimum experience differ from those of the clinical Faculty, the views of the students should at least be considered so they have an ownership of the activity or at least feel comfortable knowing their opinions are catered for .

Methods:

Instrument:

From published reports of student evaluation of teaching in general and medical education, a questionnaire was developed as part of a larger study of bedside teaching and formatted in two versions. The version to be completed by the academic staff had three questions on demographics (gender, clinical position and whether the respondent has a full-time academic position). The only demographic information collected from students was gender. Both questionnaires were otherwise similar and included twenty-two questions to be answered on a 5-point Likert scale (5=strongly agree, 4=agree, 3=neither, 2=disagree, 1=strongly disagree). One additional question was asked of the teaching staff in order to determine whether the instructors believed that a full-time academic appointment was preferred for effective instruction at the bedside. Since the students have no means of knowing whether the instructor is full-time or part time, and probably have little interest in the matter, this question was omitted from the student questionnaire. The questionnaire was piloted and delivered in two occasions to medical students elsewhere[15]. Face validity was obtained by an independent review of the questionnaire by three established international educators, after which minor changes in the wording were made. We have described the detailed construction of the instrument in a previous publication[15] . The project was approved by Health Research Ethics Board of the University of Alberta. The questionnaire was made available in both paper and electronic formats.

Subjects:

Eighty-seven final year medical students at the University of Alberta, in Edmonton in the academic year 2006/2007 received a paper copy of the questionnaire while 200 of the teaching staff received an email with a link to complete the questionnaire online in 2008.

Statistical Analysis:

SPSS was used to obtain descriptive statistics and to compare data from students and teachers using the Kolmogorov-Smirnov test. The importance of each item in comparison to others was judged on the basis of its mean and median for both groups.

Results:

Eighty seven students and fifty seven teachers responded to the survey, of whom, 55.3% and 38.6% respectively were female. Some eighty percent of the staff completing the questionnaire had a full-time academic appointment.

The percent responses of the teachers and students to each item are presented in Table 1. The responses between teachers and students were statistically different in only five items, and two of these items concerned the status of the instructor. Of the three items that dealt with the actual behaviors of the instructor, two concerned interaction of the instructor with the patient, in which the teaching staff were marginally more concerned about professional behavior than the students, while the final item in which there was a difference dealt with the motivation of students through examinations, in which the students were more keenly aware than the staff of the motivation effect of reminding students that examinations are pending.

Discussion:

In educational research it is hard to separate from opinion, view, belief and conception, which are all based on knowledge and experience. Perception, experience and conception are interdependent and interrelated from an epistemological view. Conceptions by students and staff about what makes bedside teaching an effective method of learning clinical medicine, will influence their practice like any other belief system[10] For this reason, an increased understanding of these beliefs can reveal some fundamental issues about the bedside teaching-learning experience and provide some insights about the characteristics of the ideal bedside teacher. Unfortunately, the available literature on belief and experience often makes little distinction between the two when attempting to assess what should happen when students learn from a teacher.

The rational behind this study arises from the nature of clinical education in general and bedside teaching in particular. There is ample research on evaluation of clinical teachers based on specific teacher characteristics, and the instruments used in many ways reflect the findings from the field of education in general. Extrapolation to bedside teaching may not be appropriate for at least two reasons. First, bedside teaching represents an experience that differs significantly from most other forms of teaching; a patient is present who is often actively involved in the instructional process, there are often a variety of learners at different levels during any one teaching experience, the instructor may be a volunteer rather a full-time academic staff member, issues of professionalism become very clear and so on. Second, the weight and importance of each and every characteristic maybe different For example, good communication skills at the level of patient demonstration of professional behavior may be and more important in bedside teaching than in pathology rounds or a radiology conference, even though the last two are quite properly regarded as "clinical teaching". We were thus interested in whether there are specific characteristics of the experience, whether the desirable instructor behaviors can be transferred from the general education are to the specific circumstances of bedside teaching and the relative importance of those characteristics from the perceptions of both students and teaching staff.

Students and their teachers agreed on 19 of the 22 items. They differed in the importance of the clinical rank of the teacher; students wanted either staff or a resident while the teachers (who were all at a staff level) were neutral on this choice. A further point of difference arose in the question about reminding the students of upcoming examinations. The instructors did not regard this is particularly important, but the students, who are well aware of what motivates them, felt that this was a useful thing for the instructor to do.

The issue of interaction with patient also differed slightly between student and teacher. The staff regarded respecting confidentiality of the patient and remembering the name of the patient as being rather more important than did the students, and this probably arises simply because the teaching staff have much more experience and are more aware of the importance that attaches to these things. Both staff and students felt that these issues were of prime importance. The nineteen items on which the perceptions of the students and teachers did not differ significantly suggest that, as is widely reported in the general education literature about post-secondary educaiton[16], bedside teaching is a truly collaborative activity with students and teachers valuing the same behaviors.

Both students and staff were in agreement that modifiable behaviors such as approachability, good communication skills and giving a constructive feedback are the most important qualities of ideal bedside teachers. When instructors practice these behaviors the result is better attention, increase participation by the students and increased enjoyment by both teacher and students. It has been shown that student ratings of those teachers who provide this sort of learning experience were increased[17].

Many teachers tend to use bedside teaching sessions to give factual knowledge or even mini- lectures. Although a certain amount of factual knowledge is essential in medicine, in the views of both students and teachers, this aspect was less important in bedside teaching. In general medical education, expertise in conveying factual knowledge is generally regard as a prime quality of a successful teacher[18], and our data suggest that in this respect at least, bedside teaching may differ from more formal instruction. This view is reinforced by the observation that stress on theoretical points was regarded unfavorably by both students and staff. These results are consistent with the seminal work of Pratt and others[19] and suggest that the qualities of bedside teaching are essentially those of apprenticeship and development[9].

This study has some clear limitations; the work was conducted in one institution and the survey instrument was specifically designed and needs to be validated more completely by use at other centres and with a larger number of participants. Even with these caveats in mind, it is safe to conclude that at least in the context of this study of bedside teaching, there is substantial agreement between students and their teachers about what factors can make a teacher and his or her teaching more effective. The characteristics that are assigned a high priority by both groups include such things as clarity, feedback, encouragement of critical thinking and so on. These are behaviors that can be taught, and this reinforces the need for faculty development that specifically addresses bedside teaching. Characteristics that represent elements that can not readily be modified by the instructor (rank, gender etc), were generally rated as being less important. We observed the same thing in an earlier preliminary study using this instrument in an Omani medical school, which implies that the views of staff and students about the characteristics of a successful bedside teacher may transcend cultural boundaries.

A number of questions remain. It is uncertain what approach to Faculty Development should be taken or even if any faculty development can help to inculcate these behaviors in clinical teachers. Furthermore, bedside teaching in specific areas may show further subdivision of desirable behaviors. For example, interactions with the patient, which is generally regarded as a key part of bedside teaching, may be de-emphasized in disciplines such a surgery or anesthesia, even though patient contact is important outside the operating room. It is not clear whether these perceptions are stable or whether they will change as educational fashion changes. We will attempt to answer some of these questions in future research.

Table 6-1: The Comparison of the views of students and teachers about the ideal bedside teaching experience

Items:	**Mean** (standard deviation)		**Median**	
The ideal teacher in a BST experience would:	*Students*	*Teachers*	*Students*	*Teachers*
Be approachable	4.67 (0.47)	4.60 (0.50)	5	5
Be a good communicator with the patient	4.63 (0.48)	4.81 (0.40)	5	5
Use simple and clear language	4.49 (0.65)	4.74 (0.44)	5	5
Give students constructive feedback on their performance	4.55 (0.50)	4.62 (0.53)	5	5
Respect the confidentiality of the patient*	4.33 (0.68)	4.77 (0.47)	4	5
Encourage students to think critically	4.50 (0.50)	4.70 (0.50)	4	5
Guide to areas of further learning in relation to the patient's problem(s)	4.25 (0.54)	4.53 (0.50)	4	5
Remember the patient's name*	4.23 (0.68)	4.62 (0.49)	4	5
Be a good listener	4.45 (0.57)	4.64 (0.52)	4	5
Teach students how to write patient notes	3.85 (0.83)	4.08 (0.70)	4	4
Speak the language of the patient	3.96 (0.81)	4.08 (0.71)	4	4
Consider the psych-social aspect of the patient's illness	4.14 (0.75)	4.47 (0.54)	4	4
Use humor during teaching	4.12 (0.61)	3.94 (0.72)	4	4

*: Items which have significant difference between the 2 groups based on the kolmogorov-Smirnov test.

Table 6-1(continued): The Comparison of the views of students and teachers about the ideal bedside teaching experience

Items: ***The ideal teacher in a BST experience would:***	**Mean** (standard deviation)		**Median**	
	Students	*Teachers*	*Students*	*Teachers*
Remember students' names	4.12 (0.75)	4.19 (0.71)	4	4
Guide students to the sources of information they will need	4.06 (0.46)	4.13 (0.52)	4	4
Be a resident*	3.56 (0.77)	2.88 (0.84)	4	3
Be staff member*	3.90 (0.74)	3.38 (0.91)	4	3
Remind students of the exams/tests to come*	3.75 (0.83)	2.87 (1.10)	4	3
Be male	2.96 (0.48)	2.71 (0.78)	3	3
Be female	2.95 (0.46)	2.71 (0.78)	3	3
Stress mostly the theoretical rather than the practical issues around the case	2.24 (0.65)	2.04 (0.52)	2	2
Refer to the patient by his/her illness	2.08 (0.87)	1.68 (0.75)	2	2

*: Items which have significant difference between the 2 groups based on the Kolmogorov-Smirnov test .

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Chapter VII

Discussion

This discussion is intended to extend and to complement the discussion in the papers that form the basis of chapters III, IV, V and VI.

General:

Many reports have been written about the importance of teaching at the bedside (El-Bagir, 2002; Langlois and Thach, 2000; Kroenke et al, 1997, Thibault, 1997; LaCombe, 1997; Fitzgerald, 1993; Belken and Neelon, 1992), yet those that have looked at the situation in detail have considered mainly the teacher's perspectives (Ramani et al, 2003; Nair et al, 1998; Nair et al, 1998; Kroenke et al, 1990). Very few draw conclusions based on qualitative research of bedside teaching as seen through the eyes of both student and teachers (Williams et al, 2008; Ramani et al, 2003). This paucity of literature about one of the most ancient methods of learning clinical medicine may have led, with many other factors and barriers, to the decline of its use in the development of a new generation of doctors.

In addition to the barriers to teaching at the bedside that have been discussed by Ramani et al, (2003), it is possible that this method of learning clinical medicine receives less than full attention because it is not one of the legitimate day-to-day defined activities that are an intrinsic part of clinical practice. In this regard, it is different from rounds, morning meetings, radiology conferences, and on-call duties. Teaching may happen in these situations but the primary intention is the education of those in practice so that they develop improved ability to provide good clinical care. On the other hand, bedside teaching is also not that well defined as a legitimate teaching method compared more conventional programs such as courses in ACLS (Advanced Cardiac Life Support) or clinical skills (Gale and Gale, 2006), lectures or problem-based learning tutorials. Unlike bedside teaching, these activities have received considerable attention from those in medical education research. Even in the recording of teaching activities by members of the academic staff for issues of promotion and tenure, bedside teaching often occupies a "grey area". Outstanding bedside teachers have been nominated several times for teaching awards in the Faculty of Medicine and Dentistry at the University of Alberta, but the success rate is very much lower than those who teach in a lecture setting. The research described in this thesis has been aimed painting a big picture of bedside teaching by trying to define certain aspects that are necessary for its success as a tool of learning.

Rather than attempt to examine the barriers to bedside teaching, or to consider the reasons why this approach is falling out of favor, we were more interested in what perceptions stakeholders hold about ideal and effective bedside teaching. Once that information has been obtained, the issue of barriers to effective bedside teaching can be addressed from a more informed perspective. Such a study could be coupled with (or preceded by) an observational qualitative study of what actually happens during bedside teaching. According to the findings of the ideal compared to the real practice and addressing the reasons for such discrepancy, one then could consider solutions in terms of faculty development, restructuring of the curriculum, designing of new evaluation formats and developing new systems of rewards for teachers. The effectiveness of those solutions should be tested against the initial criteria of the ideal bedside teaching experience by a continuous re-evaluation of all the previous steps to ensure quality and to detect changes that arise from difference is people, time and place. This whole process should be part of the general context of clinical education to measure its short and long terms aspects of its effectiveness on all stakeholders. This is a very ambitious scheme, but at least the work reported here may represent a very small start to a process that is necessary to ensure that we graduate skilled physicians.

It might be argued that rather than examine bedside teaching from a research perspective, it would be easier to extrapolate findings from other fields or from general clinical education about the desirable features of effective teachers/process/setting. We would maintain, however, that although there are commonalities, each method has its specific features that make generalization difficult. For example we found out that almost every respondent was in favor of a proper introduction by name to the patient and vice versa, something can't be extended to "teaching on the run" or teaching in an operating theater. Lave (1993) argues that learning is situated in that it is a function of the activity, context, and culture in which it occurs and cannot be studied meaningfully unless this property is considered. So it is important to study each activity in its real context and culture in order to come up with answers that pertain to authentic experiences in that specific culture of learning/teaching practice. We found evidence in the area of clinical education that extending findings from other situations, activities, methods, or cultures may not provide a completely useful picture. "Approachability" for example, is regarded as a useful characteristic for an instructor in other aspects of clinical education or, indeed in education in general, but "approachability" in the context of bedside teaching is very different from "approachability" as a lecturer, tutor or even as a preceptor in other branches of instruction in clinical medicine. The intimate association of the student, teacher and patient that occurs in bedside teaching has no exact equivalent on other aspects of medical training. This may be true for other commonly-used terms; "problem-based learning" is another example, and the implementation of something called "problem-based learning" can differ widely from one medical school to another. Perhaps further research is needed to clarify the conceptualization of all the jargon in medical education since there is no uniform, valid and agreed medical education terminology to inform researchers and educators.

The practice of clinical education suffers from the absence of an empirically-derived clinical education theory, but many researchers have attempted to make a link to other theories of learning without addressing the unique nature of learning in clinical education, which happens in teams and in a very complex socio-cultural context. We attempted to utilize some of the theories such as social cognition theory, the zone of proximal participation and the cognitive apprenticeship model to inform some aspects of our study. That does not mean this work is a replication or confirmation of previous theories, nor that any of the models/theories we described in Chapter II actually explain the phenomenon of bedside teaching, however it is helpful to look at the process of bedside teaching through this sort of lens. We think Bandura's Social Cognitive Theory and Erricson's Deliberate Practice Theory could inform a good basis for further research in this area.

Amongst the nine educational productivity factors found in the general education of school students, the amount of time students engage in learning and the quality of the instructional experience including method and content, are the two main factors that make learning more productive (Walberg, 2003). Thus, we approached our study with two goals in mind, optimizing instruction and better utilizing the engaged time students spend during bedside teaching to be more productive of learning.

The reason that we wanted to examine the differences between the various groups as a post-hoc evaluation of our data, stems in the fact that learners and their teachers are not a homogenous population. It is important to understand the differences and to identify the commonalities. There is a need to recognize that the behavior of students and teachers that can be observed in this sort of study represent points on the continuum, it is crucial to consider all aspects when plans are made to develop a better evaluation of instruction or to design faculty development. It becomes easy to invoke such differences to maintain the status quo in education by claiming that every situation is different and that information obtained in one site cannot rationally be applied to another. The presence of common trends over a range of different sites is an effective means of silencing this argument. That said, we have treated our data with caution and attempted not to be carried away by our enthusiasm for the changes that the results suggest. We recognize that the data are not perfect and we have tried to avoided over-interpretation that might arise from information that is statistically significant but may of minimal educational significance. For that reason we feel that an extended statistical analysis should wait until the psychometrics of the instrument have been evaluated and additional data obtained. This aspect is mentioned again in the following section. It will be evident from Chapters III-VI and the appendices however, that the information may be useful in the further development of clinical teaching.

The emotional state of the student has an important influence over his or her learning (Ende, 1995), and Control Theory suggests that input from students who believe that their opinions will alter the learning environment might be a valuable source of information. We have thus attempted to take full account of student opinion in this study. It is easy to believe that learning would be encouraged in students who could see their preferred method of instruction applied, in whole or in part, to their actual learning situation. That their voice would be heard and that they had some ownership of whatever teaching approach or evaluation method they experience, would inevitably be important to them, and the value of the research discussed in this thesis is partly that it provides support for one aspect of student-centered learning. Although it is possible that the conclusions outlined in the previous chapters may be interpreted as prescriptive and imply that there needs to be a stronger grip on bedside teaching activities, this increased control is designed to improve quality and not to place unreasonable demands on either students or instructors.

Methodology:

At an early stage of this project, when the methodological approach to the question being asked was still being considered, we were very interested in doing a qualitative research study to understand the phenomenon of bedside teaching more closely and thoroughly. The initial plan was to observe bedside teaching in practice and try to measure the qualities that lead to its success as in phenomenology research . Despite this enthusiasm, after much discussion and debate we elected instead to utilize a quantitative research methodology. The difficulty of pursuing a qualitative study in isolation from the larger context of society or of clinical practice, and the possibility of a Hawthorne effect (Adair, 1984) or a Halo effect, together with the other factors that were outlined in Chapter 2 discouraged us from going that direction. We believe that observation of bedside teaching as it actually occurs is an inevitable next step in the research in this area, but we felt that initially we needed to know what the stakeholders perceived as important in an ideal situation. This will enable subsequent research to examine specific areas of real bedside teaching and determine how those beliefs translated into action, and to attempt to account for any discrepancy between concept and reality (Kane et al, 2002).

The only method to identify what teachers and students believe is by direct questioning. This direct questioning maybe done through structured interviews, but the students and instructors in Oman may be more reticent about their perceptions for many cultural reasons. In order to obtain honest answers with the ability to compare and contrast groups, it seemed evident that a comprehensive questionnaire was the most appropriate method. Until the culture of medical education practice changes, attaching figures to results remains one of the most effective ways of convincing committees and administrators to change, which is the ultimate aim of much research in medical education.

The psychometric features of the questionnaire were beyond the scope of this round of research. Nevertheless, the content validity of the instrument was satisfied according to the experts' opinion who agree that the items are representative of the domain in question . Face validity was evident too from the comments of the experts and of the students. The instrument by enlarge measured the hypothetical construct of bedside teaching and so that provided evidence of construct validity. Accordingly, we can say that validity of the instrument is adequate at this early stage of research. . The questionnaire was administered to five different groups of respondents at different times over last few years with stable and sometimes similar results, and this points to the reproducibility of the instrument and suggests that it may be an appropriate measure that can be used with different groups of learners and teachers at different times, which by itself is a sign of good reliability, adding to the evidence of validity of the instrument .

The length of the questionnaire, which was 11 pages comprising 83-90 items, was an issue that concerned us, and we expected this to be more of a problem with the non-English speaking group in Oman. In practice less than 4% of the respondents failed to complete the whole questionnaire and about half of the incomplete questionnaires came from Alberta. Anonymity is easy to maintain with this questionnaire, whether it is administered in a paper form or online, and it also easy to collect, analyze and report the results.

We used a 5 point Likert scale for most items in the questionnaire to avoid the possibility of respondents becoming bored as a result of being presented with more extensive choices of 7 or 10 options. In addition, the nature of the questions asked seemed unlikely to require or justify that level of refinement. Because in a substantial number of items we felt that "neutral" or "neither agree nor disagree", might be the most honest response, we offered a middle choice rather than forcing a decision on those undecided or who had no strong feelings either way. We observed that offering the central choice response did not trigger a popular tendency for that option in any of the groups examined, in contrast with reports about a cultural pattern in the responses to the Likert scale (Lee et al, 2002). In addition to there being no evidence of a central tendency in the responses, there was also no obvious leniency, defined as the tendency to rate something too high or too low (i.e. to rate in an extreme way), or proximity which is defined as giving similar responses to items that occur close to one another on the questionnaire (Albaum, 1997).

In consideration of the debate as to whether Likert-type items are best considered as ordinal or continuous (Muthén & Kaplan, 1985), we usually treated Likert-type item response choices as ordinal, although we sometimes reverted to the acceptable practice of considering the data to be continuous. Thus, we usually elected to use non-parametric tests such as the Kolmogorov-Smirnov (K-S) test to investigate the significance of difference in response between the various groups. The K-S test was particularly useful, because it enabled us to measure the difference in the structure of the two data sets we were comparing, with the added advantage of tending to base the comparison around the center of the scale (Siegel and Castellan, 1988). This worked better for our 5-point Likert items.

There is an ongoing debate about the use of factor analysis on Likert-type items especially in a multi-group context. The analysis of Likert-scale data under the assumption of multivariate normality was found to distort the factor structure differently across groups, and the robustness may be questionable (Lubka et al, 2004). For this reason we did not attempt exhaustive factor analysis of our results although the numbers of respondents for some of the groups or combinations of groups do fall within acceptable limits of sample size for factor analysis suggested by Hutcheson & Sofroniou (1999). Despite this caution, we published some exploratory factor analysis results to show the richness and diversity of the data we could obtain from more than three hundred respondents completing an extensive questionnaire, together with some significant conclusions. For example, Chapter III details the clustering of the "demographics domain" of teacher's characteristics - gender, language, clinical rank etc – and this finding was consistent and useful.

Characteristics of effective bedside teachers:

Reports about the link between student achievement and being taught by "good" teachers are abundant (Pangaro and Roop, 2001;, 2000;Blue et al, 1999; Griffith et al; 1998; Griffith et al; 1997). Studies of variations in the patients whose cases had been seen by the students, the number of cases seen, the complexity of the cases or the degree of responsibility for patient care assigned to the student, shows little or no effect on student achievement at the end of their clinical training if done without supervision and feedback (Fung et al, 2007; Pipas et al, 2002; Markham et al , 2002; Rattner et al, 2001). These research finding tend to be ignored by those who believe that learning in the clinical situation is dependent only on the maximum possible exposure of the students to a larger and more varied number of patient encounters, those who encourage students merely to spend long hours in clinical sites, and those who think learning arises simply from observation or experience. It is much more reasonable to suppose that what matters to learning is the quality of those patient encounters, in terms of supervision coupled with constructive feedback provided by teachers who are determined that their teaching will make a difference to student learning and achievement (Wimmers et al, 2006; Gruppen et al, 1993). The data cited earlier suggests that those teachers will receive high ratings as "good teachers" by students and peers. Experience is not the same as learning, and so if learning is not planned in an appropriate way, the activity becomes merely one of honing of previous ability or confirming previous prejudices. This confusion may be responsible for many of the deficits reported in new graduates from medical schools.

The issue of resident teaching in comparison to senior faculty has been looked at extensively but with mixed findings (Wamsley *et al*, 2004), Bing-You and Sproule, 1992; Callcut et al, 2004). Our studies suggest that there was a preference of a bedside teacher being a staff member rather than a resident, in agreement with the findings of Stern et al (2000). We are not sure if this preference arises because of the age of the teacher (which implies more experience), or because the staff member may have better teaching skills or enhanced empathy. It may also arise from the fact that staff members are the examiners during and at the end of the clerkship, and it is noteworthy that the students preferred an instructor who reminded them of upcoming evaluations.

There is evidence that the language and terminology used by the teacher in dealing with the patient do have an effect on how they think about their illness (Bedell et al, 2004), That is why simple language and clear communications around the patient's bed are important characteristics of the professional doctor and the good teacher.

From our results, students want a good bedside teacher who is approachable, a good listener, a good communicator, treats both patient and students with respect, pays great attention to the patient's comfort, dignity and all aspects of his/her problem(s), who gives constructive feedback, creates a friendly atmosphere for learning by using humor, and remembering names, and who can guide sustainable practical learning.

The results shown in Chapter III suggest that the characteristics of the ideal bedside teacher may be categorized into non-modifiable factors such as gender or spoken language, somewhat modifiable factors such as academic or clinical rank that may change as, for example, a resident becomes a member of the academic staff, and factors that may be modified over a short time period such as being approachable, a good listener, a good communicator, and so on. The last category proved to be regarded as the most important by respondents in all groups compared to the first and to a lesser extent the second category (Table 2-2). Those results agree with those of Wright et al (1998) who found in studying role models in medicine that their age, gender and academic rank did not associate with them being desirable role models.

The culture of medical practice in Oman is different from the situation in North America and in some other countries because the medium of communication for those working in the field is English while the patients and students speak Arabic as a first language. Usually, medical interviewing is done in Arabic and then translated to English, and often the patient does not understand what is said about him or her unless someone volunteer a translation. Regardless of all this complexity, students and their teachers in Oman were indifferent to issues of language, and about the nationality of the teacher provided that their communication was in simple and clear language that a patient can understand either directly or in translation. To those that plan the clinical curriculum, it seems that this issue of dual linguistics in the field should not be allowed to hinder the quality of the bedside teaching, at least based on this study from those in Oman.

Results from all groups suggest that the most preferred characteristics of the teacher, all of which could be modified in the teacher was determined to make the changes, revolve around general personal behaviors of being approachable, being a good listener, being good communicator, and the use of simple and clear language. Other positive characteristics are aligned with some general educational skills such as reminding students of examinations and the need to know the information in order to successfully complete their program, guiding students to sources of further learning, and giving students constructive feedback on their performance. Nevertheless, there are other teacher behaviors that are more specific to bedside teaching, such as need for the teacher to consider the psychosocial aspect of the patient's problem, to stress practical rather than theoretical issues, to guide students to further learning about the patient's problem, to role-model respect for the confidentiality of the patient, to remember the names of patients and students, to encourage students to think critically about the case and teach them how to write patient notes. Those specific characteristics are unique and important because they revolve around the central agency of the patient in terms of respectfully using the patient as a trigger point for further learning of clinical medicine.

An extensive review of the reliability of evaluation of the teachers in clinical medicine (Beckman et al, 2004) found a great variation in those forms and recommended studies (like ours) to design evaluations based on specific methods, learners and educational settings because generalizability of those standard forms is questionable. The findings of the specifics of bedside teaching confirm this.

Throughout the history of medical education the patient has been considered as an embodiment of signs and symptoms that the learner can utilize to advance his or her knowledge of diagnosis and management. Unfortunately this concept has changed or been forgotten. On the basis of our findings, we suggest that we medicine should continue to be taught at the bedside with a patient-centered approach that will enable the students to learn not only about illness and its management, but about the whole issue of a patient-centered approach to medicine. These results and opinions echo the seminal work of Pratt and others (2002) on perspectives on teaching; clearly the processes in bedside teaching are those of apprenticeship and development.

We do not know exactly how doctors develop into teachers of clinical medicine, but we know that once they are placed in that role, they do make a difference in their learners. With those characteristics, we may be able to facilitate that development, for example, by encouraging and training doctors to be develop those modifiable characteristics that are listed above.

Preferred Settings:

A model of bedside teaching is simply a description of the learning environment in which it takes place. Such a model may include the complex interactions between any of the individuals involved, their behavior and the physical environment or setting. The setting of such activity is thus of great importance to those at the planning level of a clinical curriculum, those that teach it and those learn from it. In chapter V an attempt was made to explore the general setting for bedside teaching in the light of our results, with a view to examining the managerial side of the activity. As far as we can determine, this is the first time attempt to understand the perception of teachers and students about the group composition, timing, number of sessions, who is to be involved and where it should happen. In addition to the issues discussed in the article in Chapter V of this thesis such as the choice of where and when bedside teaching should take place, we found the diverse views about optimum group size rather interesting. One might *a priori* expect one-to-one teaching or a very small group to be universally preferred. A few papers have discussed this issue such as the work of Dolmans et al (2002) who found no effect of the group size as a variable in clerkship learning. More than 80% of students and their teachers in Alberta prefer a group of 1-3 students, and that is generally consistent with the current allocation of students in teams during clerkships. In Oman, teachers prefer a larger group of 4-6 whilst students were divided between this and a smaller group of 1-3. Clearly, for all the interactions, feedback and hands-on experience of bedside teaching a smaller group would be preferred in the light of the guidelines for deliberate practice or a traditional apprenticeship model. This may be offset by issues of logistics and feasibility; in places where clinical training venues are limited, trainers are few or when intake of schools is huge due to public demands, this idea will have to change. Currently in Oman there is often a group size of twelve around the bed of the patient, and we need to be aware that learning may be hindered in a group as large as this.

The observations described in this thesis suggest that consideration of the ideal bedside teaching experience as perceived by students and teachers in two distant cultures is a useful way to re-think the learning in clinical education. Williams and colleagues (2008) reached similar conclusions using qualitative research methodology. Those characteristics identified here as important can inform the design of a curriculum that uses the educational time more effectively. Almost all the students want organized bedside teaching to happen at least 3-4 times per week, and this view is shared by about three-quarters of the teachers, despite the fact they are often not rewarded for bedside teaching, and that such teaching requires additional effort on the part of the teacher. This is in agreement with the findings of previous research calling for a quality clinical educational experience rather than simply providing a large amount of clinical exposure. Meanwhile this raises some questions about many traditions in undergraduate clinical education such as clerkship duration and over-night stays in hospitals.

There is evidence that the average bedside teaching session in North America lasts no more than 3-6 minutes (Cox, 1993). This observation has triggered a number of articles that comment on the unfortunate decline in the use of bedside teaching as a principal method of learning clinical medicine (Lacombe, 1997; Miller et al, 1992). The preferred average duration for bedside teaching sessions was about 55 and 52 minutes for teachers in Oman and Canada respectively, and 60 and 36 minutes for students in Oman and Canada respectively. This coupled with the desired number of sessions per week that each group would like (appendix, Table 2), give substantial idea of the value placed on bedside teaching by the respondents. It is worth pointing out that the item asking about the ideal duration of the bedside teaching session came before the items that detail the ideal bedside teaching process. The chances that students were influenced to respond to the item about duration in such a way as to accommodate the extensive items encountered later, is thus very remote.

Where the first language of the student and often of the teacher is different from the language of instruction, there will be an additional cognitive load on the students, who will need to translate the information to a different language before it can stored in the working memory. This may account for the fact that students in Oman generally wanted longer and more frequent sessions for the absorption and processing of "subject matter" than their counterparts in the undergraduate program in Alberta, although another possibility is the prior experience of the groups in Oman who are usually exposed to longer bedside teaching sessions. The reason why teachers in Alberta were in favor of longer sessions is not clear.

This prior experience and local culture of practice was clearly responsible for the overwhelming choice of the Omani groups of morning as the preferred time for bedside teaching and an in-patient setting as the preferred site. In contrast for the Canadian groups, the time of the day or site was not an issue. In Canada, services are increasingly moving to ambulatory settings and patients get shorter hospital stays even if they are admitted as inpatients . In Canada, then, it makes sense to move the teaching to outpatient clinics, but this is not true everywhere in the world. For example, in Oman the stays of inpatients are longer and in addition provide a very much more variable mix of patients, who are often more suitable as subjects for student learning. Ambulatory care is not yet well developed in Oman compared to Canada, and so the optimum learning environment is different.

In research on deliberate practice, late morning sessions were found to be more useful than those offered at any other time of the day. This correlates with the choice of the Omani group although a profound factor in that choice is the tendency to slow down activities in the afternoons particularly in hospitals, where most patients will be having an afternoon nap (Naska et al,2007).

Turning to gender issues, in Oman, we still see groups of female students working together in clinical education venues for cultural reasons, although medical education itself is not segregated. Knowing that half of the student body, and half the respondents from the Oman group of students are female, this could explain the 38.5% of students in favor of having segregated groups according to gender, compared to the 40% who were against the idea; teachers were mostly against the idea of segregation of students based on gender.

The students in Canada had no particular preference as to whether they were seated or standing during the bedside teaching session while their counterparts in Oman were marginally more interested in being seated. Providing seating for students is both more realistic and more important in a "protected time" bedside teaching environment where the instruction may take up to an hour, and is more difficult to do in the environment of clinical service as happens in Canada. There is an interesting difference in the preference for the wearing of a white coat by the students. It is a custom in Canada that the white coats of students are shorter than those of practicing clinicians, and so the distinction can easily be made. This not the case in Oman where there is no difference between the length of the white coat worn by individuals with different levels of expertise. It is possible that the wearing of the same coat as the preceptor gives the students in Oman a welcome feeling of belonging to the same professional group, although there are also cultural difference in terms of dress that undoubtedly play a role.

While the students and teachers in Oman and the students in Canada were reluctant to have the teaching occur in the presence of a relative, this opinion was stronger in Oman, possibly because the presence of relatives is more probable in that environment. The teachers in Canada had felt less strongly, and it may be that this is not a matter of major concern in that environment.

In past years, the apprentice in clinical medicine used to have one teacher from whom he or she would learn the craft of medicine . When we asked the views of the respondents on the statement: "it is best if one teacher instructs all bedside teaching sessions for the entire clerkship" , we never thought that 42% of Oman students and 78.5% of the teachers in Canada would be still in favor of that approach. That was unexpected especially the response from the teachers, who must have understood that this might not be practicable. A possible explanation is the culture of practice; students are put in teams for the entire clerkship and so the only bedside teaching that they receive is from members of the team. Most of the time the teaching is by the staff member or the person who is interested most in teaching and this means that the students and staff may identify this one individual as the instructor throughout the clerkship.

Although the answers to all the items on the ideal setting of the bedside teaching experience suggest that the resolution of problems in the area is relatively easy, consideration of these factors is critical when trying to put bedside teaching into operation. For example, if teachers want to spend 5 minutes during a working round to provide some teaching, while the students feel that the optimum time is substantially longer, this difference of opinion may ruin whatever plans had been made to teach those students. The safest conclusion here is to consider looking into the cultural factors of both people and practice of medicine and medical education before deciding on what goes into the setting. In general, students and their teachers are in favor of smaller groups of less than 6 students, and sessions of 36-60 minutes in duration, but the other factors are strongly context-dependent.

Process characteristics:

Only seven out of the more than three hundred respondents thought the items in the process section of the questionnaire to be inappropriate in conducting a bedside teaching session. In other words, 98% of the respondents agreed that the aspects we examined are valid and acceptable. With this in mind, we can examine with some confidence the items or groups of items and discover the views of the four groups studied.

There are inherent steps in bedside teaching that we used as the basis of the construction of the items that asked about the process, and to organize the flow of this section of the questionnaire. That these steps are more than an arbitrary or theoretical classification, we demonstrated that the stages do appear to exist by conducting factor analysis on the combined data from students in Oman and Canada (Chapter IV). It is premature to assume that each of those domains or steps exists in every bedside teaching experience, but we can group them according to a series of general themes like patient comfort, or summary of learning or learning at the patient's bedside. A sensible if more conservative approach might be to divide the process as activities before the actual bedside teaching, followed by those at the bedside, and finally activities after the bedside encounter. In some ways this is analogous to the conventional view of any teaching session as requiring set, body and closure.

Physicians who volunteer to teach medical students may not be acquainted with the stage of development of knowledge and skills in those students and may not be clear about the objectives of the part of the program in which they are involved. Indeed useful educational objectives may not be available. This leads to a great deal of wasted time in all aspects of teaching throughout the undergraduate program and beyond into residency training . Thus, a good learning activity needs to be planned and delivered to match the student's need and stage of development from novice to expert. Evidence of this requirement can readily be found in the abundant literature on constructivism, which emphasizes that we learn new things based on our past experience . It is thus not surprising that all four groups unequivocally agreed that in the preparation stage of their bedside teaching it was necessary to construct new knowledge on an existing framework. There was equal enthusiasm for the teacher telling the student explicitly what they are suppose to learn from the clinical encounter, or in other words, clarifying the learning objective of the session.

We included eleven items concerning respect, care and comfort of the patient during the process of bedside teaching (items 4.2, 4.3, 4.4, 4.5, 4.9, 4.11, 4.12, 4.13, 4.25, 4.26, & 4.27). These included questions about informing the patients beforehand of the plans to use them for teaching purposes, obtaining permission, explaining thoroughly what will take place, informing learners about any special circumstances in that particular patient, paying full attention to a proper introduction to learners to patients and vice versa, dealing with questions by the patient, and remembering to thank him/her sincerely at the end of the session. In general there was strong agreement throughout all groups that these matters were important and constituted an important part of the bedside teaching session. We also investigated this domain of patient comfort and dignity to a rather more controversial level. The first issue that we looked at in this regard was whether written consent from the patient is a necessary part of an ideal bedside teaching experience. Teachers felt that written consent was unnecessary, probably for practical reasons, while students were divided in their views. Data presented in Chapter IV suggests the need for an informed, but preferably verbal agreement rather than a written consent. We clearly suggested that such consent is taken ahead of time and not as a last minute agreement when the doctor walks to the patient with students and asks for permission of what is going to happen in few minutes time! This is what the patient does not want (Benson et al, 2005). The second potentially controversial issue concerned the length of time that students should spend by the patient's bed. The answers to this question probably reflected the prior experience of each group as we noted in Chapter V; the groups in Oman preferred a longer stay of 30-60 minutes compared to those from Alberta who wanted less than 30 minutes. Only seven people in the entire study wanted to spend more than 1 hour at the bedside, which suggests that both students and teachers are conscious about comfort of the patient. This sort of considerate behavior may explain the reports that suggest that patients enjoying the teaching happens around them (

ref), although the details of the perceptions of the patients is certainly an area for future research.

Although we may claim that bedside teaching resembles the real working environment, we know that in order to fully engage and challenge the learner, the task and the learning environment should reflect the complexity of situation in which the learner should be able to function at the conclusion of their education. Learners must not only have ownership of the learning or problem-solving process, but of the problem itself. Yet, the clinical environment in which bedside teaching takes place has other components that correspond to the real world of clinical medicine and which transcend the structured approach to declarative knowledge of conventional clinical skills. For example, in real clinical practice, the in-charge nurse of the patient attends any rounds on her patient, and thus we asked the students if the nurse should be informed in advance about bedside teaching that was planned for her patient. Three of the four groups agreed that this was desirable, but the student group in Alberta were neutral. The same group was opposed to the nurse actually attending the session, based on a different item in the "general settings" section. Teachers in Alberta and Oman were also opposed to attendance by the nursing staff, although to a lesser degree than the Alberta students, while the student group from Oman was generally in favor of the presence of a nurse. This result may arise from the desire on the part of three of the four groups to have a bedside teaching experience that involves a reasonably homogeneous group of learners and one instructor; the presence of a nurse who is neither a teacher nor a learner might be seen to be an unnecessary addition. Furthermore, in clinical service bedside teaching, the nurse will inevitably be much more concerned about the patient than about student learning, and this may be an added reason for the attitude of the students in Alberta. The reason why the nurse was more welcome at the bedside teaching sessions in Oman is less clear; perhaps the nurse was less likely to become involved in the discussion at the bedside. It is worth noting that there is increasing interest in using allied health professionals to provide instruction for medical students in a variety of different teaching situations, although the old hierarchies make this difficult for some instructors to accept.

In theory, the current practice of bedside teaching involves the student interviewing the patient and preparing the case for a presentation at the beginning of the session, followed by discussion or verification of the information presented by the student. The time taken for this sequence of events varies ., but it is often sufficiently protracted that very often the session involves less active participation by the students who simply watch the preceptor take the history or perform the physical examination. This has led to a documented decline in the key skills of history-taking and performing a physical examination. In fact teachers seldom observe a student actually taking a complete history and physical examination on a real patient.

In an attempt to clarify what the respondents thought were the important features of the actual involvement of a student with a patient, we asked whether the students should be provided with any prior information about the patient. The students from Oman agreed that this was a good idea, while all the other groups were neutral. This does mean most of the respondents were comfortable with the possibility of using the bedside teaching process in outpatient clinics where students see the patient for the first time and prior information is generally incomplete or not available. Also it suggests that a useful part of bedside teaching involves observing learners practicing their skills in the absence of much information, and taking them through the process using a "thinking aloud" approach or articulation of learning. This was regarded as useful by all groups, in agreement with the findings of Dolmans (2002).

In addition to the teacher observing and articulating learning as it happens, he/she is in a position to demonstrate communication skills to the students, to listen to the student presenting the case, and to ask and answer questions. In agreement with the findings of Goertzen (1995), all groups were in favor of these factors being included in a description of the ideal bedside teaching experience. Therefore, around the patient's bed, learning happens by proper introduction, modeling, coaching, and articulation of learning, questioning, and attending to the comfort of the patient.

Teaching at the bedside can produce an overwhelming amount of information, and students are not always able to discern for themselves what matters are important and what is of lesser relevance and interest. While giving a summary of the learning immediately after it happens is a widely accepted part of the conclusion of a lecture, this is less well established in other instructional formats. Helping the students to identify the important things that they have learned is an important part of the process. Thus we asked if the teacher should point out again what was learned and then summarize the findings, or help the students to summarize what had been learned. Goertzen (1995) found that the qualities students preferred in their family medicine preceptors included a good summation of the information that should have been learned. All groups found those items to be consistent with the appropriate expectations of an ideal teacher except for the group of Alberta teachers who were neutral about the teacher providing the final summary. This may be because there is considerable and increasing emphasis at Alberta on the need for self-directed learning, and this may mean that the instructors want the task to be done by the students. It seems reasonable that the process of sorting out the important information for themselves, may help the students to develop self-regulation and independence do deal with their future exposure to overwhelming amounts of information. It is useful to compare the two approaches providing summaries of what has been learned in the light of the analogous situation at the conclusion of a problem-based learning tutorial, where the facilitators may spend time comparing the stated objectives for the tutorial with the objectives created by the students.

After the encounter at the bedside, the discussion and conclusions of the bedside teaching represent the final stage of the process, and this usually happens away from the patient's bed. At this time, feedback is supposed to be given, discussion of the learning takes place and the concluding practical "take-home message" is made explicit.

Immediate and constructive feedback by the teacher to the student maybe considered the single most important feature that differentiates learning from experience, whether we consider the issue through the lens of deliberate practice, apprenticeship or active learning. An item which reflects the ample research about how much learners value timely and constructive feedback received agreement by all groups. All groups also agreed to the need for the teacher to correct any misconceptions or doubt the student may have, which is an important step in "reflecting in-action" before further detailed discussion and learning follow. This corroborates many similar findings from previous research on the need for feedback, such as the findings of Sirnivasan et al (2007) when learners benefited more from feedback on their performance than from watching a video of their performance without any feedback. Therefore, the most useful form of constructive feedback is the one given by an experienced teacher as compared to learner's or peer's independent reflection.

Vygotsky (1978) claims that instruction is good only when it proceeds ahead of development. Under these circumstances, he claims that it awakens and rouses to life an entire set of functions which are in the stage of maturing, and which lie in the zone of proximal development. It is in this way that instruction plays an extremely important role in the actual process of change. In this study, we included two items, one in "process" and another in "teacher's characteristics" that bear on "critical thinking". The need to challenge the students to develop increased reasoning powers by exploring various aspects of the clinical problems is important since it is likely that bedside teaching can be designed at multiple levels of complexity to suite learners at different stages of their learning. Both items were unequivocally accepted by all groups, and this is consistent with recommendations about the structure of higher education (Maudsley and Strivens, 2000).

All groups agreed on some basic elements of how the discussion of the patient and their condition should proceed. The factors included the need to compare and contrast the case in question with other similar patients, an explanation based on the pathophysiological issues in the patient, a discussion of how the patient should be investigated and managed, the relation of the findings to basic science knowledge, and an appreciation of the role of evidence-based medicine. Comparing and contrasting ("binary opposition") is a very useful method by which the students learn to appreciate the differences between similar conditions and discover the different types of clinical presentation. An examination of the entire pathophysiology will help the student to understand that the condition may not be localized to the site or organ where it is most clearly manifested, and encourage an appreciation of a more holistic approach to the patient and their condition. The discussion of management and investigation builds on the earlier process of history-taking and physical examination, and of course, represents the next stage in the process of caring for a real patient. Finally activation of prior knowledge accumulated during the pre-clinical training will enable the student to understand what is really happening, and evidence-based medicine is the cornerstone of ongoing professional practice.

As a final conclusion of the session, all groups welcomed a description by the teacher of any personal experience of similar cases, identification of learning outcomes, and some guidance about future encounters with similar patients. This sort of reinforcement would be expected to be regarded as important, and general rules and guidelines are very helpful even if the knowledge gained is much more case specific (ref).

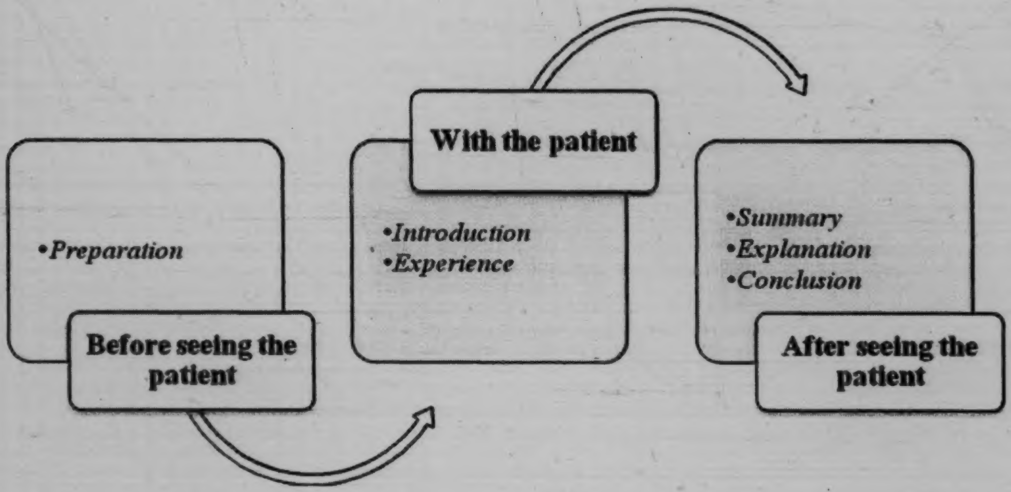
A number of questions in this section received variable responses, and in retrospect, the item might be considered highly case-specific, vague or ambiguous by the respondents. The items in question are as follows:

- "I would like the teacher to stress theoretical knowledge during the patient encounter"
- "I would like the teacher to give me time to take notes during the patient encounter"
- "Patient encounter should stress history and physical only"
- "I would like to discuss management and investigations at the bedside"
- "I would like the teacher to help me devise a flowchart, working plan or an algorithm for future patient encounters"
- " I would like the teacher to give me written material summarizing the things I learnt from this bedside teaching"

For example, while there was general agreement that the concepts of basic science need to be activated in discussion of a clinical case, to describe this as "theoretical" is open to individual interpretation. While the students might enjoy the opportunity to take notes, particularly in clinical-service bedside teaching, there may be far too much going on for this to be realistic. The students certainly need to discuss management and investigations, but the students and instructors may appreciate that doing this at the bedside may be inappropriate. In some cases developing an algorithm may be useful, but in some instances this has already been done by National agencies, so the exercise may not be useful, while in other cases, there may be so many special features that developing such a chart may be inappropriate or irrelevant.

In summary, our data suggest that the ideal bedside teaching process should start with an appropriate preparation by informing the patient about the teaching that is planned and ensuring his or her consent. The learning objectives of the session should be made explicit to students, which implies that the instructor should have thought about the issues that he wishes to teach before the session actually begins. In addition it is helpful if the students learn in advance of any aspects of the patient and their condition that are special or unusual. At the bedside, there should be an introduction by name between patient and students, and the following communication which may involve asking and answering questions should be in simple and clear language. The instructor should demonstrate and try to provide every opportunity for the students to practice history-taking and physical examination and should coach them as they carry out these activities. Either at the bedside or immediately after leaving the bedside, the teacher should reinforce the key points of the learning, help the students to summarize what has been learned and provide additional feedback. This discussion should involve a more detailed look at the encounter with the patient, with explanation and elaboration by the teacher and an encouragement for critical thinking on the part of the students. Any misconceptions on the part of the students should be identified and cleared up. Issues of pathophysiology, investigation and management should be discussed, and the entire case placed in the context of the basic science knowledge that the students already possess. Finally, the students should identification of the key take-home message and the group should conclude with guidelines for encounters with future patients. Although this sounds very prescriptive, we recognize that there may be a wide range of variations in this overall strategy with regard to both the order and the content. The suggestions made above arise directly from the information from our respondents, but depending on the situation, some flexibility is clearly appropriate.(Diagram 1)

Diagram 1: Steps of Bedside Teaching Process


•Preparation
Before seeing the patient
With the patient
•Introduction
•Experience
•Summary
•Explanation
•Conclusion
After seeing the patient

We were interested in knowing whether the students would be interested in going back without the teacher to the same patient to practice skills they have learned. Both groups of student wanted to have this opportunity, but the teachers were neutral about this. Students are often starved of opportunities to practice the skills that they have learned, and it is not surprising that they would like to return and gain more practice. In some cases this unstructured and unsupervised learning is an important part clinical education, although the students are often nervous and uncomfortable about working with patients when there is no observation by a qualified physician. While the teachers were not actively opposed to the possibility, their reservations about it are also easy to understand. The patients have already given time to student learning, and their physicians may be understandably reluctant to have them pestered again by students. In addition interactions of patients and students in a completely unsupervised environment may make the teaching staff nervous, particularly with more junior students.

As was mentioned above, exploration of the possible steps in the process of bedside teaching does not mean we advocate the mindless adoption of the formal structure suggested above. It is important to differentiate between "structuring" and "formalization" of clinical education. The former means providing a more useful structure to the activities to maximize student learning, while the latter may result in those "formal activities" become a goal in themselves. For example, if a medical school makes increased attendance at bedside teaching mandatory, without paying attention to the effectiveness of the learning that happens, the formal change may not result in improved student learning, and the move may waste everybody's time.

Our argument in favor of "structuring" clinical education should not be interpreted as dismissive of "informal" and "incidental" learning. During the clerkship any day-to-day activities in a clinical setting may bring new and unexpected learning, and these opportunities also play a role in the socialization of students into the culture of medical practice (Swanwick, 2005). We believe that all these components complement each other, but it is unwise to depend on "incidental", unstructured or opportunistic learning as the primary means of delivering clinical education. Students need a variety of learning experiences to enable them to become competent physicians. More discussion is surfacing with regard to self-directed learning in clinical medicine where researchers argue the need for "guidance" in various degrees (Greveson and Spencer, 2005). This provides circumstantial evidence that putting some guidance and organization in clinical education by bedside teaching is useful and is consistent with our findings; almost everyone thought that a discussion of the detailed characteristics of the bedside teaching process would be useful and practical (Table 2-5, Chapter II)

To develop this thought further, it is important to achieve the right balance between the degree of structure and flexibility that is built into the learning process. Many contend that the more structured the learning environment, the harder it is for the learners to construct meaning based on their own conceptual understanding of the material. A facilitator should structure the learning experience just enough to make sure that the students get clear guidance and parameters within which to achieve the learning objectives, but the learning experience should be open and free enough to allow for the learners to discover, enjoy, interact and arrive at their own, socially verified version of truth.

Traditionally, educators look at student-centered learning as the opposite of teacher-centered learning with calls to increase activities in favor of the former and limit activities directly related to the latter. This is a limited view and rather naïve way of looking at one of the more important aspects of andragogy. Rather we think that activities in bedside teaching are best regarded as a balance and interplay of these two approaches, or, as it is advocated in general education, to be a transactional view (Elen et al, 2007). The final year students are in favor of the teacher being aware of their background skills and helping them to summarize teaching and clarify take home messages for them, activities that would be often considered teacher-centered rather than student-centered. If the students actually seek a teacher-centered approach and the strategy provides the students with what they want, is this teacher centered or student-centered? Perhaps it is wiser to look beyond this paradigm, and consider the final outcome in terms of student learning.

We do not know at this point if all the factors that we explored in the bedside teaching process work independently, collectively, or associate into groups. In contrast to the work of Harth et al (1992) and others to identify the characteristics of "bad teachers" or " negative aspects" of clinical teaching that hinder learning, our study aimed at identifying the positive characteristics. On few occasions, we negatively phrased the item such as "refers to the patient by his/her illness" in teacher's characteristics to ensure no "proximity" of responses to Likert-type items. Thus, we do not know if the absence of those characteristics or the existence of negative ones shapes the bedside teaching experience. Obviously, some negative characteristics play an important role in hindering the experience and they are as important as the positive ones. Further research is needed to clarify this. There is some evidence from models of clinical teaching that have features in common with our work, such as the "one minute preceptorship" (Neher et al, 1992) that general rules can work independently, but the results are by no means conclusive.

This study did not examine the relationships between different characteristics of the teacher and the process, and therefore we do not know whether these additive or independent. It is certain, however, that the two domains are interrelated and interdependent. For example a teacher who is a good communicator will provide constructive feedback more effectively to students, and a teacher who is a good listener will be better able to help a student who is thinking aloud what she/he is detecting during a physical examination. How those different domains interact and influence each other is important to our understanding of the way in which novice students develop into expert practitioners. In addition, we have not investigated these concepts in the real world of bedside teaching; they remain as perceptions and we have no evidence that they are ever applied in practice, apart from anecdote and personal experience. This study, for research purposes, attempted to simplify a complex clinical learning environment to help our understanding of this unique teaching method, but much work remains to be done.

In this study, we explored the characteristics of teachers, process and settings as three rather separate issues, but it is possible to argue that this sort of division is artificial. The interaction between teacher and process has already been mentioned, and one could consider that the setting is actually an intrinsic part of the process rather than having a separate identity. In fact, as was mentioned earlier, we believe that these factors are interrelated, although there is a clearer distinction between the factors that we identified as setting and those that for process or teacher characteristics. The teacher has a great deal of control over the important part of the teacher characteristics and substantial control over process, while the setting is more likely to be controlled by the institution. It is often the administration and the curriculum planning group that make decisions about group size, mix, number of sessions, timetabling, and involvement of others health care workers.

It is very interesting to note that when we talked about characteristics of teachers there were essentially no significant difference between the two medical schools (See Chapter III and Abstract 5), but there were some differences in the factors considered as process and substantial differences in the preferred setting for bedside teaching. Perhaps there are common things medical students share, regardless where they come from or where they practice, but there are a many specific factors in the environment and context that differ between sites. Educators should be aware of those context-specific items, so that they know what is transferable from published research and what is entirely dependent on the local environment. Similar results were found by Goldstein and Benassi (2006), who reported that students and teachers differ in the appreciation of the teaching technique but not in the characteristics of the teacher him- or herself . Stark (2003) found differences of what students' and their teachers value as good clinical education , and recommended more research and transparency about objectives and education curriculum to reach better consensus between those two education partners.

Finally, although this thesis has been concerned with bedside teaching, this is just one modality that can be used in clinical teaching. There are other effective methods which complement each other and which also need to undergo a more thorough investigation. One of the primary goals of research into clinical education in general should be to determine what/when/how/who/where to apply each of these teaching-learning strategies so that student learning is optimized. Certainly a balanced but diverse approach will result an easier and more efficient development of the novice student into a competent doctor during their clinical education.

This research was limited by the use of a newly constructed instrument with limited validation of its psychometric features, length, and ambiguity of some items. Also, it was limited by the two institutions where it was done on convenience samples.

Chapter VIII

Conclusions and Future Directions

Questions raised by the findings of this study are intriguing but in no way unexpected. The teaching/learning process is a complex human transaction, dependent on a multitude of variables—psychological, sociological, and environmental—which have to be studied before definitive results can be forthcoming and recommendations for effective teaching can be advanced. The complexity of this process is multiplied by the milieu in which clinical teaching takes place. Pain, suffering, and the ever present threat of death, found in most clinical settings, create an atmosphere unsuitable for learning. Added to this highly charged atmosphere is the fear of possible grave consequences resulting from errors the learner might commit. The ability to transform this unsuitable milieu into one conducive to learning is a skill needed by an effective clinical teacher — a skill not often shared by teachers in other settings.

This study was unique as a first time attempt to measure perceptions about protected-time bedside teaching. It attempt to explore an ancient method of learning clinical medicine, bedside teaching, through a comparison of the perceptions of the main stakeholders (students and teachers) about what they think are the characteristics of an ideal bedside teacher, the ideal bedside teaching process and the setting of the ideal bedside teaching.

This research was limited by the need to devise a lengthy purpose-made instrument to assess the opinions of the students and the teachers, that fact that only two sites were investigated and the limited and number of respondents. Nevertheless, based on the 83-90 items in the questionnaire and the answers provided by 309 respondents, we conclude:

1. The most preferred characteristics of bedside teachers include the general personal behaviors of being approachable, being a good listener, being a good communicator, and using simple and clear language. The properties also include some general educational skills such as teaching in the context of examination and evaluations, guiding students to sources of further learning, and giving students constructive feedback on their performance. Finally, in this group of ideal teacher characteristics we identified some behaviors that are specific to bedside teaching, such as consideration of the psychosocial aspect of the patient's problem, emphasis on practical clinical issues rather than theory guiding students to further learning about the patient's problem, respecting the confidentiality of the patient, remembering the names of patients and students, and encouraging students to think critically about the case and teaching them how to write patient notes. All these characteristics can be modified by the teacher in the light of feedback or faculty development. Characteristics that were either more difficult or impossible to change such as linguistic ability, gender, and academic or clinical rank were regarded as being much less important.

2. The ideal bedside teaching process should start with an appropriate preparation by informing the patient about the teaching that is planned and ensuring his or her consent. The learning objectives of the session should be made explicit to students, which implies that the instructor should have thought about the issues that he wishes to teach before the session actually begins. In addition it is helpful if the students learn in advance of any aspects of the patient and their condition that are special or unusual. At the bedside, there should be an introduction by name between patient and

students, and the following communication which may involve asking and answering questions should be in simple and clear language. The instructor should demonstrate and try to provide every opportunity for the students to practice history-taking and physical examination and should coach them as they carry out these activities. Either at the bedside or immediately after leaving the bedside, the teacher should reinforce the key points of the learning, help the students to summarize what has been learned and provide additional feedback. This discussion should involve a more detailed look at the encounter with the patient, with explanation and elaboration by the teacher and an encouragement for critical thinking on the part of the students. Any misconceptions on the part of the students should be identified and cleared up. Issues of pathophysiology, investigation and management should be discussed, and the entire case placed in the context of the basic science knowledge that the students already possess. Finally, the students should identification of the key take-home message and the group should conclude with guidelines for encounters with future patients.

3. The general setting of how bedside teaching operates is very context-dependent, but there was general agreement that smaller groups of less than 6 students, and sessions of 36-60 minutes duration are preferred and may be more conductive to learning.

We conclude that bedside teaching is a method of learning clinical medicine that can be enhanced by consideration of this information. Based on our results we recommend that consideration be given to the following the following research strategies in future:

1- Investigation and if necessary revision of the instrument that was developed

2- Triangulation of research at methodology, and participation levels

3- Further investigation of elements of this research and an investigation of how they may operate in real life situations. We suggested elsewhere in this thesis that a qualitative study involving focus groups with students and teachers would be useful in this regard, and the possibility of video-recording actual bedside teaching sessions and observing the behaviors would complement the findings of this study.

4- Similar studies for other methods of clinical teaching, how to they operate together and how they affect learning. It is necessary to investigate issues such as the well being of the learner, the retention of skills after graduation, the role of undergraduate learning in specialty choices and the development of teaching skills in the medical graduates so that there are effective teachers for the next generation of students. Ultimately, of course, the key question is are there long term gains such as improved patient care and patient satisfaction.

We advocate a patient- , teacher- and student-centered bedside teaching strategy that operates a contextual, constructive, balanced and collaborative model of studying medicine at the bedside.

The intention of the research was not to examine the theoretical basis of this sort of learning, but to find out the views of those who are actively engaged in the process as teachers or students. If this work spawns additional and more focused studies of effective bedside teaching, we will have achieved our objective. It was not our intention to develop a rigid formula, but to open some discussion.

It is typical that in the early stages of research on a topic, the inconsistencies and ambiguities that result from the methodology, especially when using a new purpose-made instrument, can be frustrating. However, these often spur the next round of investigation, and over time the evidence converges and generates consensus. This study represents the first round of investigation and is no exception to this rule. We have tried to move the discussion about bedside teaching from the realm of anecdote and opinion to a more sound and evidence-based discourse. It represents a small step in that direction, but a journey always starts with a single step.

I would like to see an increased confidence in the medical education arena when we talk about the contributions of each method of learning medicine to the needed outcomes of medical education. For example, I dream of a day when an educator can estimate the value of doing an on-call duty for 12 hours overnight and pinpoint clearly its educational value and long term effects on the learning and well being of future doctors. Of course this ideal medical educator would also consider the health of those receiving the medical care provided by that individual doctor. I would like a time when we can attest the value of morning meeting, radiology meeting, seminar and every single activity to produce a model of productive learning similar to those that have sometimes been adopted in in general education.

Finally, our picture of ideal bedside teaching is incomplete until we get information and insight into the perceptions of that key stakeholder around whom and for whom this learning happens - the patient.

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Appendix I

The Instrument (4 versions)

Effective Bedside Teaching (BST): Students' Perspectives

A Survey of 7th Year Medical Students at Sultan Qaboos University, Oman

Dear Student Doctor,

Thank you for accepting to participate in this survey.
As you know that the College is reforming the curriculum into a better one.
One of the most important areas of reform will be the clinical teaching in order to improve it.
This survey constitutes the first step in a series of surveys aim to produce a firm and reliable evaluation system of clinical teaching.
In this questionnaire we are trying to seek your opinion regarding what you think is "Effective Bedside Teaching". Your opinion will help identifying the main characteristics of an effective bedside teaching session. The clinicians and patients will complete similar questionnaires to enable us to come to a consensus of the different parties' views of effective bedside teaching.
Your three years of experience at different sites with different teachers and your experience overseas give you a lot of insight and definitely will help us designing the most appropriate BST for the future.
Remember that this is NOT an evaluation of the current BST, but just an identification of what you think is ideal or effective BST.
The questionnaire is designed and its results will be analyzed by me, Dr. Yousef Al Weshahi. You will be informed individually as a 7th year student with the results in addition to their publication on the College website.
This questionnaire is completely anonymous and you do not have to indicate your name or anything related to your identification on any part of it.
You have the right not to respond to any item in the questionnaire and you can always contact me by e-mail at weshahi@hotmail.com for any enquiry.
I would like you to complete in the questionnaire independently and return it in the attached envelope to the designated box in the main building of the College.

Thanks again for your co-operation.

Dr. Yousef Al Weshahi,
Curriculum Committee.

Dear Student Doctor,

We in the College of Medicine are proud of you graduating soon as a fully qualified doctor to serve your community.
As you may have noticed we are trying to reform our curriculum in order to improve the learning environment to produce the best doctors to take care of your and our families.
In the process of reviewing and reform, we value you as one of the most important sources for input and help; this is mainly because you had the real experience of our current curriculum.
We would like your opinion regarding one of the most important and basic areas of teaching that is Bedside Teaching (BST). The following questionnaire tries to identify " The Characteristics of Effective Bedside Teaching (BST), Student Perspectives", and this is a first step in a more general evaluation of the Clinical Teaching.

We value your anticipated, prompt and kind response.

Dr. Bazdawi Al-Ryami,
Dean,
College of Medicine & Health Sciences.

Dear Medical Student:

Instructions to complete this questionnaire:

1- Check the box in front of your response with √.

2- Fill in the blank using the instructions in the specific item.

3- Anywhere in the questionnaire:

-BST is Bedside Teaching. . For our purposes "bedside teaching" is defined as "teaching in the presence of a real patient, either at the bedside, in an examining room or in an office".

-Teacher is the clinical teacher, tutor or any physician or resident who is teaching you at the bedside

Remember:

1- Do not sign this questionnaire.
2- Return it to the box at the front of the class.

Section 1: Demographics:

1.1-What is your gender: ***☐Female*** ***☐Male***

Section 2: *Characteristics of Teachers in BST:*

Regardless what BST experience you had during your clinical years, think of an IDEAL BST, and accordingly respond to the following items:

I would like the Teacher in BST to:

2.1- Be Male.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.2- Be Female.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.3- Be Junior Doctor (Intern, Medical Officer, Senior House Office or Specialist).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.4- Be Senior Doctor (Senior Registerar, Consultant, or Senior Consultant)
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.5- Have an academic rank (assistant professor, associate professor or professor).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.6- Speak Arabic.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.7- Speak the language of the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.8- Be a good listener.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.9- Remind me of the exams/tests to come.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.10- Consider the psycho-social aspect of the patient's illness.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.11- Use humour during teaching.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.12- Stress mostly the theoretical rather than the practical issues around the case.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.13- Guide me to the sources of information I will need.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.14- Be approachable.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.15- Be a good communicator with the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.16- Use simple and clear language.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.17- Give me a constructive feedback on my performance.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.18- Respect the confidentiality of the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.19- Encourage me to think critically.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.20- Guide me to areas of further learning in relation to the patient's problem(s).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.21-Teach me how to write patient notes.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.22- An Omani national.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.23- Refer to the patient by his/her illness.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.24-Remember my name.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.25-Remember the patient's name.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Section 3: General Settings of BST:

Regardless what BST experience you had during your clinical years, think of an IDEAL BST, and accordingly respond to the following items:

The general settings of the BST:

3.1- I would prefer the same teacher for the BST for the entire rotation.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.2- What is the best time for BST?
☐ Morning ☐ Afternoon ☐ Either

3.3- Whereabouts is BST best offered?
☐ An Outpatient setting ☐ An in-patient setting ☐ Either

3.4- How many bedside teaching sessions should be held each week?
☐ 1-2 ☐ 3-4 ☐ 5-6 ☐ the more the better

3.5- What is the ideal number of students for a BST session?
☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10-12 ☐ Any Number

3.6- I prefer the group to be composed of the same gender.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.7- The in-charge nurse of the patient should attend the BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.8- I would like the patient's family member(s) NOT to be present during the BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.9- I prefer to be seated at the bedside during the teaching.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.10- I prefer to wear my white coat during BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.11- I like to evaluate the Clinical Teacher after each BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.12- I like to be evaluated by the Clinical Teacher after each BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.13- I like to be evaluated by my colleagues after each BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.14- I like to be evaluated by the patient I see in the BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.15- I prefer the duration of the entire BST session to be:...........................
(Give a range in minutes or hours)

Section 4: An organized BST:

Now, use your imagination as you go through the following items which are based on the sequence of events that may occur during a BST session, going from one step to another, and respond to the items accordingly.
We suggest that you GLANCE through the questions for all seven steps before you attempt to complete the questionnaire:

Step 1: Preparation.
Anytime before the BST session

4.1- I would like my teacher to know my real background and abilities in terms of knowledge and skills before the BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.2- I would like the teacher to inform the patient about the BST session beforehand.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.3- I would like the teacher have the patient sign a consent agreeing to be involved in any BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.4- I would like the teacher to inform the patient about the nature of the BST that will occur.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.5- I would like the teacher to ask the patient's agreement to the physical examination to be carried out on him/her.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.6- The teacher should, in advance, inform the in-charge nurse that BST will take place.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.7- The Clinical Teacher should be part of the patient's management team.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 2: Briefing

Immediately before going to see the patient. Outside the patient's room

4.8- I would like the teacher to tell me explicitly what I am expected to learn from this BST experience.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.9- I would like the teacher to inform me of any special characteristics of the patient before seeing him/her (characteristics such as demented, blind…etc).

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.10- I prefer to have no prior clinical information (history, findings and/or diagnosis) about the patient before seeing him/her.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 3: Clinical Experience.

With the patient.

4.11- I like the teacher to introduce me to the patient by my name.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.12- I would like the teacher to introduce the patient to me.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.13- I prefer the teacher to communicate in simple language to any questions asked by the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.14- The teacher should allow me to ask him/her questions during the session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.15- I would like the teacher to ask me questions during the patient encounter.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.16- I would like the teacher to stress theoretical knowledge during this patient encounter.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.17- I would like the teacher to give me time to take notes during this patient encounter.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.18- I would like the teacher to demonstrate his/her communication skills with the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.19- The session at the bedside should stress history taking and physical examination ONLY:
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.20- I would like the teacher to discuss investigations and management at the bedside.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.21- I would like the teacher to allow me to present the case.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.22- I would like the teacher to guide me as I elicit the physical signs.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.23- I would like the teacher to allow me to think aloud and describe what I feel during the physical examination.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.24- I would like the teacher to observe me taking history from the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.25- I should thank the patient at the end of the teaching.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.26- I would like to go back to the patient when the teacher is not there, to practice physical examination.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.27- I prefer the duration of this patient encounter to be:
☐ Less than 30 minutes ☐ 30-60 minutes ☐ More than 1 hour

Step 4: Debriefing (what did we do).

Now you are leaving the patient site with your teacher.

4.28- I would like the teacher to point out explicitly what we learnt from the patient encounter.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.29- I would like the teacher to summarize the history and examination findings and organize them logically for us.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.30- I would like the teacher to help me summarize what I have learned.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 5: Reflection.

After leaving the patient site

4.31- I would like the teacher to give me immediate feedback about my performance.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.32- I would like the teacher to allow my fellow students to give me immediate feedback about my performance.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.33- I would like the teacher to correct any misconceptions and doubts I have.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.34- I would like the teacher to encourage me to think critically about the patient encounter.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.35- I would like the teacher to encourage me to discuss information gained from other patients, as it bears on the patient that we saw.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 6: Explication (what are the explanations of this patient's problem)

You are sitting in the seminar room and freely discussing what you have seen.

4.36- I would like the teacher to explain the pathophysiological basis of the patient's problem(s).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.37- I would like the teacher to discuss how to investigate and manage such a patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.38- I would like the teacher to guide me as to how this case relates to basic science knowledge.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.39- I would like the teacher to inform me of the evidence in the literature to support the management plan.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.40- I would like the teacher to tell me about his/her experience(s) with similar patients.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step7: Working Knowledge.

You are still in the seminar room

4.41- I would like the teacher to help me to identify the key learning outcomes from this BST experience.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.42- I would like the teacher to conclude with some guidelines for encounters with future patients.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.43- I would like the teacher to help me to devise a flowchart, working plan or algorithm for future patient encounters.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.44- I would like the teacher to give me a written material summarizing the things I learnt from this BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.45- I think it is important to thank my teacher for his/her effort.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.46- I think these seven steps of BST would be an effective and practical system for examining the bedside teaching process.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Thank You

Effective Bedside Teaching (BST): Students' Perspectives

A Survey of 4th Year Medical Students at University of Alberta, Canada

To: **Members of the Class of 2007**

***From*: Dr. David Cook/ Dr. Yousef AlWesh[illegible], Division of Studies in Medical Education**

We are well aware of the key role effective bedside teaching plays in your education. Unfortunately there have been rather few studies that permit us to identify exactly what characteristics are perceived by staff and students as making the experience effective. This question is the subject of a PhD in Medical Education that is being undertaken by one of us (Dr. Al-Weshahi), and we are seeking information from both staff and students about the criteria which they believe influence a successful outcome in terms of student learning. We already have some data from another University (Sultan Qaboos University, Oman, Dr. AlWeshahi's alma mater) and we are also interested in determining whether the key characteristics transcend geographical and cultural boundaries. This study is designed to seek the student perspective of what makes the entire experience of bedside teaching more effective. Remember that this is NOT an evaluation of the current bedside teaching experience, but an attempt to identify the ideal of effective clinical instruction at the bedside. This information will help us to provide support for the teaching staff to make sure that the bedside teaching is as effective as possible, and will, we believe be useful to many other medical schools, worldwide.

To this end, we are asking you to complete and return the enclosed questionnaire. We ask that you return the questionnaire in the enclosed envelope, either using campus mail, or by returning the completed questionnaire to the box at the front of this classroom. Please note that you will not be identified by name at any time in the process. If you would like a copy of the publications that will result from this survey, please send this request via e-mail to coleen.kato@ualberta.ca. We will send you the papers as they appear.

We appreciate your consideration of this request. Your views will help us to determine what factors we need to consider when we are helping students to learn more effectively in the bedside teaching environment. If you have any further questions please contact us at the addresses below.

Yours truly,

Dr. David Cook/Dr. Yousef Al-Weshahi
Division of Studies in Medical Education
2-76 ZLC, University of Alberta
Edmonton, Alberta T6G 2X8
Ph: (780) 492-6848
Fax: (780) 492-5487
david.cook@ualberta.ca or yousef@ualberta.ca

Dear Medical Student:

Instructions to complete this questionnaire:

4- Check the box in front of your response with √.

5- Fill in the blank using the instructions in the specific item.

6- Anywhere in the questionnaire:

-BST is Bedside Teaching. . For our purposes "bedside teaching" is defined as "teaching in the presence of a real patient, either at the bedside, in an examining room or in an office".

-Teacher is the clinical teacher, tutor or any physician or resident who is teaching you at the bedside

Remember:
3- Do not sign this questionnaire.
4- Return it to the box at the front of the class.

***Section 1:* Demographics:**

1.1-What is your gender:* ☐*Female ☐***Male***

Section 2: *Characteristics of Teachers in BST:*

Regardless what BST experience you had during your clinical training, think of an IDEAL BST teacher, and respond to the following items:

I would like the Teacher in BST to:

2.1- Be Male.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.2- Be Female.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.3- Be a resident.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.4- Be a staff member.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.5- Speak the language of the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.6- Be a good listener.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.7- Remind me of the exams/tests to come.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.8- Consider the psychosocial aspect of the patient's illness.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.9- Use humour during teaching.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.10- Stress mostly the theoretical rather than the practical issues around the case.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.12- Guide me to the sources of information I will need.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.13- Be approachable.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.14- Be a good communicator with the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.15- Use simple and clear language.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.16- Give me constructive feedback on my performance.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.17- Respect the confidentiality of the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.18- Encourage me to think critically.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.19- Guide me to areas of further learning in relation to the patient's problem(s).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.20-Teach me how to write patient notes.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.21- Refer to the patient by his/her illness.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.22-Remember my name.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.23-Remember the patient's name.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Section 3: General Settings of BST:

Regardless what BST experience you had during your clinical training, think of an IDEAL BST experience, and respond to the following items:

The general settings of the BST:

3.1- I would prefer the same teacher for the BST for the entire clerkship.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.2- What is the best time for BST?
☐ Morning ☐ Afternoon ☐ Either

3.3- Whereabouts is BST best offered?
☐ An Outpatient setting ☐ An in-patient setting ☐ Either

3.4- How many bedside teaching sessions should be held each week?
☐ 1-2 ☐ 3-4 ☐ 5-6 ☐ the more the better

3.5- What is the ideal number of students for a BST session?
☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10-12 ☐ Any Number

3.6- The in-charge nurse of the patient should attend the BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.7- I would like the patient's family member(s) NOT to be present during the BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.8- I prefer to be seated at the bedside during the teaching.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.9- I prefer to wear my white coat during BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.10- I would like to evaluate the teacher after the BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.11- I would like to be evaluated by the teacher after the BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.12- I would like to be evaluated by my colleagues after the BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.13- I would like to be evaluated by the patient in the BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.14- I prefer the duration of the entire BST session to be:……………………….
(Give a range in minutes or hours)

Section 4: An organized BST:

Now, use your imagination as you go through the following items which are based on the sequence of events that may occur during a BST session, going from one step to another, and respond to the items accordingly.

We suggest that you GLANCE through the questions for all seven steps before you attempt to complete the questionnaire:

Step 1: Preparation.

Anytime before the BST session

4.1- I would like my teacher to know my background and abilities in terms of knowledge and skills before the BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.2- I would like the teacher to inform the patient about the BST session beforehand.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.3- I would like the teacher have the patient sign a consent form agreeing to be involved in any BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.4- I would like the teacher to inform the patient about the nature of the BST that will occur.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.5- I would like the teacher to ask the patient's agreement to the physical examination to be carried out on him/her.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.6- The teacher should, in advance, inform the in-charge nurse that BST will take place.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.7- The Clinical Teacher should be part of the patient's management team.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 2: Briefing

Immediately before going to see the patient. Outside the patient's room

4.8- I would like the teacher to tell me explicitly what I am expected to learn from this BST experience
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.9- I would like the teacher to inform me of any special characteristics of the patient before seeing him/her (characteristics such as demented, blind…etc).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.10- I prefer to have no prior clinical information (history, findings and/or diagnosis) about the patient before seeing him/her.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 3: Clinical Experience.

With the patient.

4.11- I would like the teacher to introduce me to the patient by my name.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.12- I would like the teacher to introduce the patient to me.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.13- I prefer the teacher to communicate in simple language to any questions asked by the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.14- The teacher should allow me to ask him/her questions during the session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.15- I would like the teacher to ask me questions during the patient encounter.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.16- I would like the teacher to stress theoretical knowledge during this patient encounter.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.17- I would like the teacher to give me time to take notes during this patient encounter.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.18- I would like the teacher to demonstrate his/her communication skills with the patient.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.19- The session at the bedside should stress history taking and physical examination ONLY:

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.20- I would like the teacher to discuss investigations and management at the bedside.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.21- I would like the teacher to allow me to present the case.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.22- I would like the teacher to guide me as I elicit the physical signs.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.23- I would like the teacher to allow me to think aloud and describe what I feel during the physical examination.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.24- I would like the teacher to observe me taking history from the patient.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.25- I should thank the patient at the end of the teaching.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.26- I would like to go back to the patient when the teacher is not there, to practice physical examination.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.27- I prefer the duration of this patient encounter to be:

☐ Less than 30 minutes ☐ 30-60 minutes ☐ More than 1 hour

Step 4: Debriefing (what did we do).

Now you are leaving the patient site with your teacher.

4.28- I would like the teacher to point out explicitly what we learnt from the patient encounter.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.29- I would like the teacher to summarize the history and examination findings and organize them logically for us.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.30- I would like the teacher to help me to summarize what I have learned.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 5: Reflection.

After leaving the patient site

4.31- I would like the teacher to give me immediate feedback about my performance.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.32- I would like the teacher to allow my fellow students to give me immediate feedback about my performance.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.33- I would like the teacher to correct any misconceptions and doubts I have.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.34- I would like the teacher to encourage me to think critically about the patient encounter.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.35- I would like the teacher to encourage me to discuss information gained from other patients, as it bears on the patient that we saw.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 6: Explication (what are the explanations of this patient's problem)

You are sitting in the seminar room and freely discussing what you have seen.

4.36- I would like the teacher to explain the pathophysiological basis of the patient's

problem(s).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.37- I would like the teacher to discuss how to investigate and manage such a patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.38- I would like the teacher to guide me as to how this case relates to basic science knowledge.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.39- I would like the teacher to inform me of the evidence in the literature to support the management plan.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.40- I would like the teacher to tell me about his/her experience(s) with similar patients.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step7: Working Knowledge.

You are still in the seminar room

4.41- I would like the teacher to help me to identify the key learning outcomes from this BST experience.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.42- I would like the teacher to conclude with some guidelines for encounters with future patients.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.43- I would like the teacher to help me to devise a flowchart, working plan or algorithm for future patient encounters.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.44- I would like the teacher to give me a written material summarizing the things I learnt from this BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.45- I think it is important to thank my teacher for his/her effort.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.46- I think these seven steps of BST would be an effective and practical system for examining the bedside teaching process.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Thank You

Effective Bedside Teaching (BST): Teachers' Perspectives

A Survey of Clinical Teachers at Sultan Qaboos University, Oman

Dear Doctor,

Thanks for agreeing to participate in this important comparative study of bedside teaching.

Teaching at the bedside is considered an important learning method for clinical medicine in many parts of the world, yet little is known about how to make this more effective. This study was designed to seek your opinion as an expert clinical teacher of what makes the entire experience of bedside teaching more effective.

Similar questionnaires have been completed by your final year medical students at Sultan Qaboos University. We want to compare your perspectives with those of your students.

Your valued experience gives you a lot of insight and definitely will help us knowing more about BST and so designing the most appropriate BST for the future.

Remember that this is NOT an evaluation of the current BST, but just an identification of what you think is ideal or effective BST.

The questionnaire is designed and its results will be analyzed by me, Dr Yousef Al Weshahi. You will be informed about the results and their publication via an appropriate channel.

This questionnaire is completely anonymous and you do not have to indicate your name or anything related to your identification on any part of it.

You have the right not to respond to any item in the questionnaire and you can always contact me by e-mail at weshahi@squ.edu.om for any enquiry.

I would like you to complete in the questionnaire independently and return it in the attached envelope.

Thanks again for your co-operation.

Yousef Al Weshahi

Dear participant:

Instructions to complete this questionnaire:

7- Check the box in front of your response with √.

8- Fill in the blank using the instructions in the specific item.

9- Anywhere in the questionnaire:
-BST is Bedside Teaching. For our purposes "bedside teaching" is defined as "teaching in the presence of a real patient, either at the bedside, in an examining room or in an office".
-Teacher is the clinical teacher, tutor or any physician or Resident carrying out bedside teaching.
- Student is any medical student involved in the bedside teaching.

Remember:
5- Do not sign this questionnaire.
6- Return it via the enclosed envelope.

Section 1: Demographics:

1.1- What is your gender: ***☐ Female*** ***☐ Male***

1.2- Are you: **☐ Senior Consultant** **☐ Consultant**
☐ Senior Specialist **☐ Specialist** **☐ Junior Specialist**
☐ Medical officer **☐ Senior House officer** **☐ Intern**

1.3- Do you have a full-time academic rank (professor, assistant professor…etc):
☐ Yes **☐ No**

1.4- Are you an Omani national: **☐ Yes** **☐ No**

Section 2: *Characteristics of Teachers in BST:*

Regardless what BST experience you deliver as a teacher, think of an IDEAL TEACHER at the bedside, and then respond to the following items:

The ideal teacher in a BST experience would:

2.1- Be male.
☐ Strongly Agree ☐ Agree ☐ Neither ☐ Disagree ☐ Strongly Disagree

2.2- Be female.
☐ Strongly Agree ☐ Agree ☐ Neither ☐ Disagree ☐ Strongly Disagree

2.3- Be a junior doctor (specialist, junior specialist, SHO, medical officer or intern).
☐ Strongly Agree ☐ Agree ☐ Neither ☐ Disagree ☐ Strongly Disagree

2.4- Be a senior doctor (senior consultant, consultant or senior specialist).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.5- Have an full-time academic rank (assistant professor, associate professor or professor).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.6- Speak Arabic.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.7- Speak the language of the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.8- Be a good listener.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.9- Remind students of the exams/tests to come.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.10- Consider the psychosocial aspect of the patient's illness.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.11- Use humour during teaching.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.12- Stress mostly the theoretical rather than the practical issues around the case.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.13- Guide students to the sources of information they will need.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.14- Be approachable.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.15- Be a good communicator with the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.16- Use simple and clear language.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.17- Give students constructive feedback on their performance.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.18- Respect the confidentiality of the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.19- Encourage students to think critically.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.20- Guide students to areas of further learning in relation to the patient's problem(s).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.21-Teach students how to write patient notes.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.22- An Omani national.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.23- Refer to the patient by his/her illness.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.24-Remember students' names.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.25-Remember the patient's name.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Section 3: General Settings of BST:

Regardless what BST experience you deliver as a teacher, think of an IDEAL SETTING for a BST session, and answer the following items:

3.1- It is best if one teacher instructs all BST sessions for the entire clerkship.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.2- What is the best time for BST?
☐ Morning ☐ Afternoon ☐ Either

3.3- Whereabouts is BST best offered?
☐ Out-patient setting ☐ In-patient setting ☐ Either

3.4- How many bedside teaching sessions should be held each week?

☐ 1-2 ☐ 3-4 ☐ 5-6 ☐ the more the better

3.5- What is the ideal number of students for a BST session?
☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10-12 ☐ No preference

3.6- I prefer the group to be composed of the same gender.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.7- The in-charge nurse of the patient should attend the BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.8- I would like the patient's family member(s) NOT to be present during the BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.8- Evaluation of the students after the BST session is an important step.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.9- I would like the students to evaluate my instruction after the BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.10- I would like my colleagues to evaluate me after some BST sessions to get an idea about my teaching performance.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.11- I would like the patient in the BST session to evaluate my teaching.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.13- I prefer the duration of the entire BST session to be:…………………………
(Give a range in minutes or hours)

Section 4: An organized BST:

Now, use your imagination as you go through the following items which are based on the series of events that may occur during a BST session, going from one step to another, and respond to the items accordingly.
We suggest that you GLANCE through the questions for all seven steps before you attempt to complete the questionnaire:

Step 1: Preparation.
Anytime before the BST session

4.1- The teacher should know the background and abilities of his/her students in terms of knowledge and skills, before the BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.2- The teacher should inform the patient about the BST session beforehand.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.3- The teacher should have the patient sign a consent form agreeing to any BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.4- The teacher should inform the patient about the nature of the BST that will occur.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.5- The teacher should ask the patient's agreement to the physical examination to be carried out on him/her
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.6- The teacher should, in advance, inform the in-charge nurse that BST will take place.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.7- The teacher should be part of the patient's management team.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 2: Briefing
Immediately before going to see the patient. Outside the patient's room

4.8- The teacher should tell the students explicitly what they are expected to learn from the BST experience.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.9- The teacher should tell the students about any special characteristics of the patient before seeing him/her (characteristics such as demented, blind…etc).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.10- I would prefer that the students have no prior clinical information (history, findings

and/or diagnosis) about the patient before seeing him/her.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 3: Clinical Experience.
With the patient.

4.11- The teacher should introduce the students to the patient by their names.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.12- The patient should be introduced to the students by the teacher.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.13- The teacher should communicate in simple (non-medical) language any questions from the patient
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.14- I would like the students to ask me questions during the session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.15- The teacher should ask questions of the students during the session at the bedside.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.16- The teacher should stress theoretical knowledge during this patient encounter.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.17- The students should be given time to take notes during the bedside teaching experience.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.18- It is important that the teacher demonstrates their communication skills with the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.19- The session at the bedside should stress history taking and physical examination ONLY.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.20- The teacher should discuss investigations and management at the bedside.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.21- I would like a student to present the case.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.22- The students should receive guidance from the teacher as they elicit the physical signs.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.23- I would like the students to think aloud and describe what he/she feels during the physical examination.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.24- The teacher should observe the student taking the history from the patient.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.25- The students should thank the patient at the end of the teaching.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.26- Ideally, I would like the students to go back to the patient when I am is not there, to practice physical examination.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.27- I prefer the duration of this patient encounter to be:

☐ Less than 30 minutes ☐ 30-60 minutes ☐ More than 1 hour

Step 4: Debriefing (what did we do).

Now you are leaving the bedside of the patient with your students.

4.28- The teacher should point out what the students should have learnt from this patient encounter.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.29- It is the responsibility of the teacher to summarize the history and examination findings and organize them logically for the students.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.30- Ideally, I prefer that the students summarize the findings and organize them.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 5: Reflection.

After leaving the bedside of the patient (you are in a seminar room)

4.31- The students should receive immediate feedback about their performance.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.32- Ideally, the students should give each other immediate feedback on their performance.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.33- The teacher should correct any misconceptions and doubts the students may have.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.34- The students should be asked to think critically about the patient encounter.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.35- The students should have the opportunity to discuss information gained from other patients, as it bears on the patient that they saw.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 6: Explication (what are the explanations of this patient's problem)

You are in the seminar room and freely discussing with the students what they have seen.

4.36- The teacher should explain the pathophysiological basis of the patient's problem(s).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.37- The teacher should discuss how to investigate and manage such a patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.38- The teacher should guide the students as to how this case relates to basic science knowledge.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.39- The teacher should inform the students about the evidence in the literature that supports the management plan.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.40- It is useful if the teacher tells the students about his/her own experiences with similar patients.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step7: Working Knowledge.

You are still in the seminar room

4.41- The teacher should help the students to identify the key learning issues from the BST experience.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.42- The teacher should conclude the session with some guidelines for encounters with future patients.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.43- The students should be encouraged by the teacher to design a flowchart, working plan or algorithm for future patient encounters.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.44- The students should receive written material from the teacher summarizing the things they learned from this BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.45- Ideally, I would like students to thank me for my efforts.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.46- I think these seven steps of BST would be an effective and practical system for examining the bedside teaching process.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Thank You

Effective Bedside Teaching (BST): Teachers' Perspectives

A Survey of Clinical Teachers at University of Alberta, Canada

This is available online

To: **Members of the clinical teaching staff**

From: **Dr. David Cook/Dr. Yousef AlWeshahi, Division of Studies in Medical Education**

We are well aware of the key role effective bedside teaching plays in the education of our medical students. For our purposes "bedside teaching" is defined as "teaching in the presence of a real patient, either at the bedside, in an examining room or in an office". Unfortunately there have been rather few studies that permit us to identify exactly what characteristics are perceived by staff and students as making the experience effective. This question is the subject of a PhD in Medical Education that is being undertaken by one of us (Dr. Al Weshahi), and we are seeking information from staff about the criteria which they believe influence a successful outcome in terms of student learning. We already have a very interesting data from 97% of the final year medical students, a data which stimulated a great discussion in the medical education arena and won the Canadian Association for Medical Education award for best poster at the 2007 Medical Education conference in Victoria, BC. We published our findings of similar study from another University (Sultan Qaboos University, Oman, Dr. AlWeshahi's alma mater) and we are also interested in determining whether the key characteristics transcend geographical and cultural boundaries. This study is designed to seek your opinion as an expert clinical teacher of what makes the entire experience of bedside teaching more effective. Remember that this is NOT an evaluation of the current bedside teaching experience, but an attempt to identify the ideal of effective clinical instruction at the bedside. This information will help us provide a better planning, evaluation and faculty development in clinical instruction, and will, we believe be useful to many other medical schools, worldwide. To this end, we are asking you to complete this online questionnaire by clicking on the following URL:

https://www.surveymonkey.com/s.aspx?sm=LxfPxuO6Tb21yEELwFreFw_3d_3d

This survey link with SSL encryption will provide highest measures to ensure privacy and confidentiality of the data, the researchers will not be able to identify or track the identity of the respondent at any time, so your participation is entirely anonymous and confidential. We estimate that it will take 10-15 minutes to complete this questionnaire.

Please note that completion of this questionnaire is ENTIRELY VOLUNTARY. Completion of this questionnaire implies consent to participate in the study. If you have any concerns about ethical issues surrounding participation, please contact either one of the investigators, or Ms. Charmaine Kabatoff, Health Research Ethics Administration, 213 Heritage Research Building, Ph: 492-0302, email charmaine.kabatoff@ualberta.ca

We appreciate your consideration of this request. Your views will help us determine what factors to consider when helping students learn more effectively in the clinical teaching environment. If you have any further questions or if you would like a copy of the publications from this study please contact us at the address below.

Yours truly,

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Instructions to complete this questionnaire:

10- Check the box in front of your response with √.

11- Fill in the blank using the instructions in the specific item.

12- Anywhere in the questionnaire:

-**BST** is Bedside Teaching. For our purposes "bedside teaching" is defined as "teaching in the presence of a real patient, either at the bedside, in an examining room or in an office".

-**Teacher** is the clinical teacher, tutor or any physician or Resident carrying out bedside teaching.

- **Student** is any medical student involved in the bedside teaching.

Remember:

7- Do not sign this questionnaire.
8- Return it via the enclosed envelope.

Section 1: Demographics:

1.1- What is your gender? ☐ ***Female*** ☐ ***Male***
1.2- Are you: ☐ **Staff** ☐ **Resident**
1.3- Do you have a full-time academic position?
☐ **Yes** ☐ **No**

Section 2: *Characteristics of Teachers in BST:*

> *Regardless what BST experience you deliver as a teacher, think of an IDEAL TEACHER at the bedside, and then respond to the following items:*

The ideal teacher in a BST experience would:

2.1- Be Male.
☐ Strongly Agree ☐ Agree ☐ Neither ☐ Disagree ☐ Strongly Disagree

2.2- Be Female.
☐ Strongly Agree ☐ Agree ☐ Neither ☐ Disagree ☐ Strongly Disagree

2.3- Be a resident.
☐ Strongly Agree ☐ Agree ☐ Neither ☐ Disagree ☐ Strongly Disagree

2.4- Be a staff member.
☐ Strongly Agree ☐ Agree ☐ Neither ☐ Disagree ☐ Strongly Disagree

2.5- Have a full-time academic position.
☐ Strongly Agree ☐ Agree ☐ Neither ☐ Disagree ☐ Strongly Disagree

2.6- Speak the language of the patient.
☐ Strongly Agree ☐ Agree ☐ Neither ☐ Disagree ☐ Strongly Disagree

2.7- Be a good listener.
☐ Strongly Agree ☐ Agree ☐ Neither ☐ Disagree ☐ Strongly Disagree

2.8- Remind students of the exams/tests to come.
☐ Strongly Agree ☐ Agree ☐ Neither ☐ Disagree ☐ Strongly Disagree

2.9- Consider the psychosocial aspect of the patient's illness.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.10- Use humour during teaching.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.11- Stress mostly the theoretical rather than the practical issues around the case.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.12- Guide students to the sources of information they will need.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.13- Be approachable.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.14- Be a good communicator with the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.15- Use simple and clear language.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.16- Give students constructive feedback on their performance.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.17- Respect the confidentiality of the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.18- Encourage students to think critically.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.19- Guide students to areas of further learning in relation to the patient's problem(s).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.20-Teach students how to write patient notes.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.21- Refer to the patient by his/her illness.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.22-Remember students' names.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

2.23-Remember the patient's name.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Section 3: General Settings of BST:

Regardless what BST experience you deliver as a teacher, think of an IDEAL SETTING for a BST session, and answer the following items:

3.1- It is best if one teacher instructs all BST sessions for the entire clerkship.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.2- What is the best time for BST?
☐ Morning ☐ Afternoon ☐ Either

3.3- Whereabouts is BST best offered?
☐ Out-patient setting ☐ In-patient setting ☐ Either

3.4- How many bedside teaching sessions should be held each week?
☐ 1-2 ☐ 3-4 ☐ 5-6 ☐ the more the better

3.5- What is the ideal number of students for a BST session?
☐ 1-3 ☐ 4-6 ☐ 7-9 ☐ 10-12 ☐ No preference

3.6- The in-charge nurse of the patient should attend the BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.7- Bedside teaching is best carried out if patient's family member(s) are NOT present
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.8- Evaluation of the students after the BST session is an important step.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.9- I would like the students to evaluate my instruction after the BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.10- I would like my colleagues to evaluate me after some BST sessions to get an idea about my teaching performance.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.11- I would like the patient in the BST session to evaluate my teaching.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

3.12- I prefer the duration of the entire BST session to be:......................
(Give a range in minutes or hours)

Section 4: An organized BST:

Now, use your imagination as you go through the following items which are based on the series of events that may occur during a BST session, going from one step to another, and respond to the items accordingly.
We suggest that you GLANCE through the questions for all seven steps before you attempt to complete the questionnaire:

Step 1: Preparation.
Anytime before the BST session

4.1- The teacher should know the background and abilities of his/her students in terms of knowledge and skills, before the BST session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.2- The teacher should inform the patient about the BST session beforehand.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.3- The teacher should have the patient sign a consent form agreeing to any BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.4- The teacher should inform the patient about the nature of the BST that will occur.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.5- The teacher should ask the patient's agreement to the physical examination to be carried out on him/her
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.6- The teacher should, in advance, inform the in-charge nurse that BST will take place.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.7- The teacher should be part of the patient's management team.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 2: Briefing

Immediately before going to see the patient. Outside the patient's room

4.8- The teacher should tell the students explicitly what they are expected to learn from the BST experience.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.9- The teacher should tell the students about any special characteristics of the patient before seeing him/her (characteristics such as demented, blind…etc).
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.10- I would prefer that the students have no prior clinical information (history, findings and/or diagnosis) about the patient before seeing him/her.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 3: Clinical Experience.

With the patient.

4.11- The teacher should introduce the students to the patient by their names.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.12- The patient should be introduced to the students by the teacher.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.13- The teacher should communicate in simple (non-medical) language any questions from the patient
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.14- I would like the students to ask me questions during the session.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.15- The teacher should ask questions of the students during the session at the bedside.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.16- The teacher should stress theoretical knowledge during this patient encounter.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.17- The students should be given time to take notes during the bedside teaching experience.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.18- It is important that the teacher demonstrates their communication skills with the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.19- The session at the bedside should stress history taking and physical examination ONLY.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.20- The teacher should discuss investigations and management at the bedside.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.21- I would like a student to present the case.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.22- The students should receive guidance from the teacher as they elicit the physical signs.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.23- I would like the students to think aloud and describe what he/she feels during the physical examination.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.24- The teacher should observe the student taking the history from the patient.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.25- The students should thank the patient at the end of the teaching.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.26- Ideally, I would like the students to go back to the patient when I am is not there, to practice physical examination.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.27- I prefer the duration of this patient encounter to be:
☐ Less than 30 minutes ☐ 30-60 minutes ☐ More than 1 hour

Step 4: Debriefing (what did we do).

Now you are leaving the bedside of the patient with your students.

4.28- The teacher should point out what the students should have learnt from this patient encounter.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.29- It is the responsibility of the teacher to summarize the history and examination findings and organize them logically for the students.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.30- Ideally, I prefer that the students summarize the findings and organize them.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 5: Reflection.

After leaving the bedside of the patient (you are in a seminar room)

4.31- The students should receive immediate feedback about their performance.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.32- Ideally, the students should give each other immediate feedback on their performance.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.33- The teacher should correct any misconceptions and doubts the students may have.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.34- The students should be asked to think critically about the patient encounter.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.35- The students should have the opportunity to discuss information gained from other patients, as it bears on the patient that they saw.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step 6: Explication (what are the explanations of this patient's problem)

You are in the seminar room and freely discussing with the students what they have seen.

4.36- The teacher should explain the pathophysiological basis of the patient's problem(s).

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.37- The teacher should discuss how to investigate and manage such a patient.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.38- The teacher should guide the students as to how this case relates to basic science knowledge.

☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.39- The teacher should inform the students about the evidence in the literature that supports the management plan.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.40- It is useful if the teacher tells the students about his/her own experiences with similar patients.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Step7: Working Knowledge.

You are still in the seminar room

4.41- The teacher should help the students to identify the key learning issues from the BST experience.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.42- The teacher should conclude the session with some guidelines for encounters with future patients.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.43- The students should be encouraged by the teacher to design a flowchart, working plan or algorithm for future patient encounters.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.44- The students should receive written material from the teacher summarizing the things they learned from this BST.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.45- Ideally, I would like students to thank me for my efforts.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

4.46- I think these seven steps of BST would be an effective and practical system for examining the bedside teaching process.
☐ Strongly Agree ☐ Agree ☐Neither ☐ Disagree ☐ Strongly Disagree

Thank You

Appendix II

Abstracts

Effective bedside teaching (BST): students' perspectives[5]

Y Al Weshahi, E Skakun, D Cook

Learning clinical medicine in the presence of patients is an invaluable method of training in clinical curricula. Its most popular form of Bedside Teaching (BST) has not been as popular in terms of educational research and a decline in the skills of BST has been reported especially that BST is going away from its principal component, patients. One of the well-documented findings of obstacles to effective BST is lack of role models and ill-defined organization. One of the known theoretical models for BST was suggested by *Kenn COX* (Cox Model), it utilizes modern learning theories to organize a more beneficial BST but it lakes the research evidence to support its rational structure. Sultan Qaboos University College of Medicine and Health Sciences is undergoing a major curriculum reform, part of which is re-looking into more standardization of BST for the seek of better learning, evaluation and reward systems. This study was designed to look at different aspects of BST from the students' perspectives, part of which is their perception of Cox Model if used for the BST.

A questionnaire composed of 46 items distributed to describe each of the 7 steps in the model (preparation, briefing, clinical experience, debriefing, reflection, explication, and working knowledge) was administered to 86 final year medical students.

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[5] Oral presentation at 11th Ottawa conference in Medical education, Barcelona, Spain, 2004

Sixty two students responded, their responses were analyzed to find fairly positive correlations between each step and the items describing it. Factor analysis confirmed the structure of the model in 2 cycles except for the debriefing step. All students agreed that this model is useful and to be used for their BST.

There is some evidence for Cox Model in BST and students are in favor of it.

Who is an effective bedside teacher? Students' Perspective [6]

Yousef Al Weshahi*, Ernest Skakun and David Cook (Division of Studies in Medical Education, Faculty of Medicine and Dentistry, University of Alberta, 2J3 Walter Mackenzie Centre, Edmonton, Alberta T6G 2R7, CANADA)

Background: Bedside teaching (BST) as an effective method of clinical teaching is declining in quality and quantity. Lack of role models in BST is one of the main obstacles for this. Most of the literature deals with role models of physicians in general, with limited attention to bedside teachers, although the educator aspect was evident in most of them. The identification of the required teachers' characteristics would be one step in gaining more confidence in BST. This study was designed to inform the curriculum reviewers at Sultan Qaboos University College of Medicine of the students' perspectives of what they consider an effective bedside teacher. This endeavor would help in identifying those physicians for better selection, development and evaluation processes in clinical education.

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[6] Oral presentation at the Association of Medical Education in Europe annual meeting, Edinburgh, Scotland, 2005

Summary of work: Based on the literature and advice from medical education experts, a 26-item questionnaire reflecting personal characteristics and process in teaching was developed. The questionnaire was completed by 60/84 of the final year students.

Summary of results: Principal component analysis supported the two domains of personal characteristics and process in BST. Frequency analysis identified the items considered to be important.

Conclusions: This study showed the possible characteristics of effective bedside teachers. However, further work in refinement, verification and replication is required.

KEY PARAMETERS IN CLINICAL BEDSIDE TEACHING: CROSS-CULTURE PERSPECTIVES[7]

Dr David Cook, Yousef Al Weshahi

Background: While there have been a number of studies that examine clinical teaching in general, there is less information about the specific events in bedside teaching that lead to optimal student learning. It is also unclear whether it is possible to make useful generalizations about what constitutes an ideal bedside teaching experience, or whether there are such profound cultural differences between different student populations that such generalizations are not helpful.

Aims: The study was undertaken to determine the perceptions of students and faculty about the ideal bedside teaching experience, and, using two rather different university populations, to determine whether the results obtained were similar.

Methods: Surveys of students and faculty members in Canada and Oman were administered. Individuals were asked to identify the importance of various factors to a successful learning experience at the bedside, and the results were processed using factor analysis.

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[7] Oral presentation at the 13 Ottawa conference, Melbourne, Australia, 2008

Results: The data suggest that appropriate preparation, emphasis on history and physical examination, appropriate feedback, summary of key learning issues and an opportunity for reflection were considered important by all groups. While there were some difference between students in Oman and Canada, there was a high degree of agreement on most issues.

Conclusions: Regardless of their cultural background, students value the experience of learning in the presence of a patient, and share most concepts of what constitutes a successful learning experience at the bedside.

Key factors in bedside teaching – a model of the process[8]

Yousef Al-Weshahi*, Dwight Harley, David Cook (University of Alberta, Division of Studies in Medical Education, 2-76 ZLC, Edmonton, Alberta, T6G 2X8, Canada)

Background: Several authors have attempted to create a model for an effective process of bedside teaching. In particular, the model suggested on a priori grounds by Cox (sequence of eight articles in Med. J. Aust. 1993) has proved to be popular.

Work done: In an attempt to substantiate this model, we used a 47-item questionnaire on perceptions of bedside teaching that was completed by one hundred and seventy four final year medical students at Sultan Qaboos University, Oman. Factor analysis suggested the existence of six domains: Preparation/patient comfort, Communication with the patient, Student learning of history and physical examination, Organizing and summarizing the findings, Reflection and Feedback. This corresponds well to the model proposed by Cox and is also consistent with some other suggested approaches. While additional data from other medical schools are being collected to confirm these observations, it seems likely that the sequential and systematic approach to bedside teaching suggested on theoretical grounds, corresponds well to the experience of students. The use of this approach may be beneficial in planning future programs of bedside teaching.

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[8] Oral presentation at the annual meeting of the Association of Medical Education in Europe, Trondheim, Norway, 2007

Student Perceptions of the Characteristics of an Ideal Bedside Teaching Experience[9]

David Cook, Yousef Al-Weshahi, Dwight Harley, University of Alberta

While there are a variety of instruments that can be used to report the effectiveness of individual instructors in a clinical setting there has been less work which attempts to delineate the characteristics of an ideal experience particularly in the context of bedside teaching. To determine the students= perspective of the characteristics of effective bedside teachers a questionnaire was administered to 84 final-year medical students. The items were constructed to examine the various behaviours of the instructor in terms of "modifiable characteristics" such as being good listener giving constructive feedback and respecting patient confidentiality. There were also items that examined characteristics such as gender academic rank and language of the teacher. A teaching characteristics index was constructed by summing the positive characteristics identified. Factor analysis suggested that the greater part of the variance could be explained by three factors the "modifiable characteristics" and two other factors one of which involved the career path of the instructor and the other such factors as gender and language. The "modifiable characteristics" were much more important determinants of effective bedside teaching than the other factors. The study confirmed the existence of the proposed distinct domains. The results for the "modifiable characteristics" domain echo the findings from more general clinical education research and suggest the transferability of findings from a general observation to the more specific situation of bedside teaching. Clearly effective bedside teaching depends critically on behaviours than can be changed.

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[9] Poster presentation at the annual meeting of the Faculties of Medicine, Victoria, BC, 2007